

# 104209

S.H.E. OF  
99-424A**FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS**  
**As Required by the Provisions of the ASME Code Rules, Section VIII, Div. 1**Item no.  
E-4207-41. Manufactured and certified by Southern Heat Exchanger Corporation 6100 Old Montgomery Highway Tuscaloosa, AL  
(Name and address of Manufacturer)2. Manufactured for KOSA, Wilmington, NC  
(Name and address of Purchaser)3. Location of Installation KOSA, Wilmington, NC  
(Name & address)4. Type Horizontal Heat Exchanger 99-424A None SB- 4179-2 10469 2000  
(Horiz,vert,sphere) (Tank,separator,jkt. vessel,heat exh,etc.) (mfg. ser. no.) (CRN) (Dwg. No.) (Nat'l. Bd. No.) (Yr. built)5. ASME Code, Section VIII, Div. 1 1998, A98 None 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): 3 (b) Overall length (ft & in): 20'-0"

(OD) Course(s)			Material		Thickness		Long Joint (Cat. A)			Circum. Joint (Cat. A,B,&C)			Heat Treat.	
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	34"	10'-0"	SA-516 GR. 70		3/8"	1/16"	1	Spot	85%	1	Spot	-	-	
1	34"	7'-0 1/4"	SA-516 GR. 70		3/8"	1/16"	1	Spot	85%	1	Spot	-	-	
1	44"	1'-9 1/2"	SA-516 GR. 70		1/2"	1/16"	1	Spot	85%	1	Spot	-	-	

7. Heads: (a) SA-516 GR. 70 (b) \_\_\_\_\_

(Mat'l Spec. No., Grade or Type) H.T.- Time & Temp										(Mat'l Spec. No., Grade or Type) H.T.- Time & Temp				
Location		Thickness		Radius		Elliptical	Conical	Hemisph.	Flat	Side to Pressure		Category A		
Top, Bottom, Ends		Min.	Corr.	Crown	Knuckle	Ratio	Apex Angle	Radius	Diameter	Convex	Concave	Type	Full, Spot, None	Eff.
(a)	Center	3/8"	1/16"	(2) 44" O.D. Flanged & Flued heads w/ 1 1/8" Kn. Rad.						X		N/A	None	-
(b)														-

If removable, bolts used (describe other fastening) Welded  
(Mat'l. Spec. No., Grade, size, no.)8. Type of jacket None Jacket closure \_\_\_\_\_  
(Describe as ogee & weld, bar, etc.)If bar, give dimensions None If bolted, describe or sketch.9. MAWP 175 N/A psi at max. temp. 350 N/A ° F. Min. design metal temp. 20 ° F. at 175 psi  
(internal) (external) (internal) (external)10. Impact test No per UG-20(f) and UHA-51

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

11. Hydro., pneu., or comb. test press. 265 psig hydro Proof test \_\_\_\_\_

Items 12 and 13 to be completed for tube sections

12. Tubesheet: SA-240 316L 34" 2 3/8" 0" Welded  
Left (Mat'l. Spec. No.) Dia., in. (subject to pressure) Nom. thk., in. Corr. Allow., in. Attachment (welded or bolted)

SA-240 316L 39" 2 5/8" 0" Welded  
Right (Mat'l. Spec. No.) Dia., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes See remarks 3/4" 16 BWG. See remarks 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): 2'-10 5/8"

(OD) Course(s)			Material		Thickness		Long Joint (Cat. A)			Circum. Joint (Cat. A,B,&C)			Heat Treat.	
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	34"	1'-5 1/2"	SA-240 316L		.375"	0"	1	Spot	85%	1	Spot	-	-	
1	34"	0'-5 5/16"	SA-240 316L		.375"	0"	1	Spot	85%			-	-	

15. Heads: (a) SA-516 GR. 70 (b) SA-240 316L

(Mat'l Spec. No., Grade or Type) H.T.- Time & Temp										(Mat'l Spec. No., Grade or Type) H.T.- Time & Temp				
Location		Thickness		Radius		Elliptical	Conical	Hemisph.	Flat	Side to Pressure		Category A		
Top, Bottom, Ends		Min.	Corr.	Crown	Knuckle	Ratio	Apex Angle	Radius	Diameter	Convex	Concave	Type	Full, Spot, None	Eff.
(a)	End	2 1/2"	0"	(Liner not included in thickness)						39"		N/A	None	-
(b)	End	1/4"	0"			2:1					X	N/A	None	-

If removable, bolts used (describe other fastening) SA-193-B7 (40) ea 7/8"-9  
(Mat'l. Spec. No., Grade, size, no.)

16. MAWP 175 N/A psi at max. temp. 350 N/A ° F. Min. design metal temp. 20 ° F. at 175 psi  
(internal) (external) (internal) (external)

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17. Impact test No per UG-20(f) and UHA-51

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

18. Hydro., pneu., or comb. test press. 265 psig hydro Proof test

19. Nozzles, inspection, and safety valve openings:

(UW-16.1)

Purpose (inlet, Outlet, Drain, etc.)	No.	Diameter or size	Flange Type	Material		Nozzle Thk.		Reinforcement Material	How Attached		Location (Insp. Opn.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Inlet/Outlet	2	6"	150#	SA-312 316L	SA-182 F 316L	.280"	0"	Inherent	e	RFSO	
Inlet	1	8"	150#	SA-106 GR. B	SA-105	.500"	1/16"	Inherent	e	RFSO	
Outlet	1	3"	150#	SA-106 GR. B	SA-105	.300"	1/16"	Inherent	e	RFSO	
Press. Indicator	1	3/4"	150#	SA-312 316L	SA-182 F 316L	.113"	0"	Inherent	e	RFSO	
Vent/Drain	2	3/4"	150#	SA-312 316L	SA-182 F 316L	.113"	0"	Inherent	e	RFSO	
Vent	1	3/4"	6000	N/A	SA-105	N/A	1/16"	Inherent	bb	Thd Cplt	

20. Supports: Skirt No Lugs N/A Legs N/A Others (2) Saddles Attached Shell, 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)22. Remarks: UG-46(a)Line 13: (923) tubes, SA-213-316L (71) tubes, SB-677 904L (UNS N08904).**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. 7037 Expires 11/29Date 04/25/00 Name Southern Heat Exchanger Corporation

(Manufacturer)

Signed

(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 GA and employed by Commercial Union Insurance Company of Boston, Ma have inspected the pressure vessel described in this Manufacturer's Data Report on 04/25, 20 00, 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 04/25/00

Signed

(Authorized Inspector)

Commissions NB11599AGA419

(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 \_\_\_\_\_, 20 \_\_\_\_\_

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 \_\_\_\_\_

(Authorized Inspector)

Commissions \_\_\_\_\_

(Nat'l Board incl. endorsement, State, Province and No.)

# 104209



R-1-3

NATIONAL BOARD NO. 10 469

CERTIFIED BY

# SOUTHERN HEAT EXCHANGER CORP.

TUSCALOOSA, ALABAMA

## SHELL SIDE

INLET	175	PSI AT	350	°F.
OUTLET	20	°F. AT	175	PSI

## TUBE SIDE

INLET	175	PSI AT	350	°F.
OUTLET	20	°F. AT	175	PSI

CHECK SER. NO. 99-424 A YEAR 2000

CUST. ORDER 450 0262 721

CUST. ITEM 1-4207-4



NATIONAL BOARD NO. 10469/10470

CERTIFIED BY

SOUTHERN HEAT  
EXCHANGER CORP.

TUSCALOOSA, ALABAMA

SHELL SIDE

MAWP 175 PSI AT 350 °F

MDMT 20 °F AT 175 PSI

TUBE SIDE

MAWP 175 PSI AT 350 °F

MDMT 20 °F AT 175 PSI

SHECO SER. NO. 99-424A/B YEAR 2000

CUST. ORDER 4500262721

CUST. ITEM E-4207-4/E-6207-4

## CAUTION

THE PRESSURE AND TEMPERATURES SHOWN ON THE S.H.E. NAMEPLATE RELATE ONLY TO THE PRESSURE RETENTION CAPABILITY OF THIS HEAT EXCHANGER. COMPONENTS OF THIS HEAT EXCHANGER HAVE BEEN DESIGNED FOR SPECIFIC OPERATING CONDITIONS. A CHANGE IN SERVICE OR DEVIATION FROM THE SPECIFIED OPERATING CONDITIONS REQUIRES THAT A MECHANICAL DESIGN CHECK BE MADE IN ORDER TO AVOID POSSIBLE DAMAGE TO THE HEAT EXCHANGER.

## NOTES

1. EST. WT. EMPTY: 17,000# FULL: 25,300# BDL: -
2. ALL BOLT HOLES STRADDLE NORMAL CENTERLINES.
3. SNAP ON COVERS ON ALL OPEN NOZZLES.
4. 125-250 MAIN GASKET SURFACES.
5. PAINT: SANDBLAST D.S. PER SSPC-SP-6. C.S.T.L ONLY: APPLY (1) COAT OF CARBOLINE C2-11. S.S.T.L ONLY: APPLY (2) COATS OF DAMPNEY THERMALOX 70 (BLACK).
6. NOZZLE FLANGES SHALL BE DUAL STAMPED 316/316L

## ANSI NOZZLE SCHEDULE

	SIZE	RATE	FACE	NOZZLE NECK	SERVICE
				TUBE SIDE	
A	6"	150#	RFSO	STD. WT.	ACID WASTE WATER INLET
B	6"	150#	RFSO	STD. WT.	ACID WASTE WATER OUTLET
C	3/4"	150#	RFSO	STD. WT.	PRESSURE INDICATOR
G/H	3/4"	150#	RFSO	STD. WT.	VENT/DRAIN
				SHELL SIDE	
D	8"	150#	RFSO	X-STG.	STEAM INLET
E	3"	150#	RFSO	X-STG.	CONDENSATE OUTLET
F	3/4"	6000#	THD	VOGT, CPLT, PLUGGED	VENT

## NON-PRESSURE PARTS

SUPPORTS / PADS	SA-36 / SA-516 GR. 70
BAFFLES / SUPPORTS	SA-36
TIE RODS / SPACERS	C.S.T.L/S.S.T.L
PASS PARTITIONS	SA-240 316L
ANNULAR DIST. SLEEVE	SA-516 GR. 70
LIFT LUGS	SA-36
NAMEPLATE BRACKET	304 S.S.T.L

## ASME CODE REQUIREMENTS

	SHELL SIDE	TUBE SIDE
DESIGN PRESSURE	175	175
DESIGN TEMPERATURE (MAX/MIN)	350/20	350/20
HYDRO. TEST PRESSURE	265	265
CORROSION ALLOWANCE	1/16"	NONE
POSTWELD HEAT TREATMENT	NONE	NONE
RADIOGRAPHIC EXAMINATION	SPOT	SPOT
METAL TEMP. (TEMA 7th ED.)	40/270	221/250

ASME CODE STAMP / NAT'L BD. REG. IS REQUIRED.

CUSTOMER INSPECTION MAY BE REQUIRED

SPECIFICATIONS: 1998 ASME CODE SECT. VIII DIV. 1, ADDENDA: A9B

SPECIAL SERVICE: NONE CODE CASE: NONE PARTIAL DATA REPORTS: NONE

TEMA (B) EXEMPT FROM IMPACT TESTING PER: UG-20(f), UHA-51

TUBES: SA-213 316L WALL: AVG

NO. 994 O.D. 3/4" BWG. 16 LENGTH: 20'-0"

TUBESHEETS: SA-240 316L

PART	SHELL SIDE	TUBE SIDE
VESSEL	SA-516 GR. 70	SA-240 316L
COVERS		SA-516 GR. 70 LINED WITH SA-240 316L
FORMED HEADS	SA-516 GR. 70	SA-240 316L
FITTINGS		SA-105 LINED WITH SA-240 316L
BODY FLANGES		SA-182 F 316L (6)
NOZZLE FLANGES	SA-105	SA-182 F 316L
COUPLINGS/COUPLES	SA-105	SA-182 F 316L
NOZZLE PIPE	SA-106 GR. B	SA-312 316L
NOZZLE REIN. PADS		
STUDS/NUTS	SA-193-87/SA-194-2H	SA-193-87/SA-194-2H
GASKETS		SEE SHEET 5 FOR DETAIL

## REVISIONS

03/28/00 REVISED ITEM NUMBER, ORIENTATION, AND ELEVATION.

01/25/00 GENERAL REVISIONS.

CERTIFIED ENG. 1003/18/00

CUSTOMER KOSA

CUSTOMER P.O. NO. 4500262721

ITEM NO. E-4207-4/E-6207-4 PROJ. NO. 147-9448.1.4025.5/

PLANT WILMINGTON, NC 147-9448.1.4043.5

TEMA SIZE AND TYPE

(2) 33-240 NEM C &amp; D-LINES ACID WASTE WATER REBOILERS

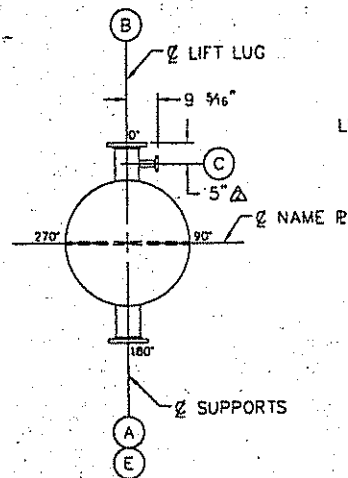
SOUTHERN HEAT EXCHANGER CORP.

P.O. BOX 1850 TUSCALOOSA, AL. 35403

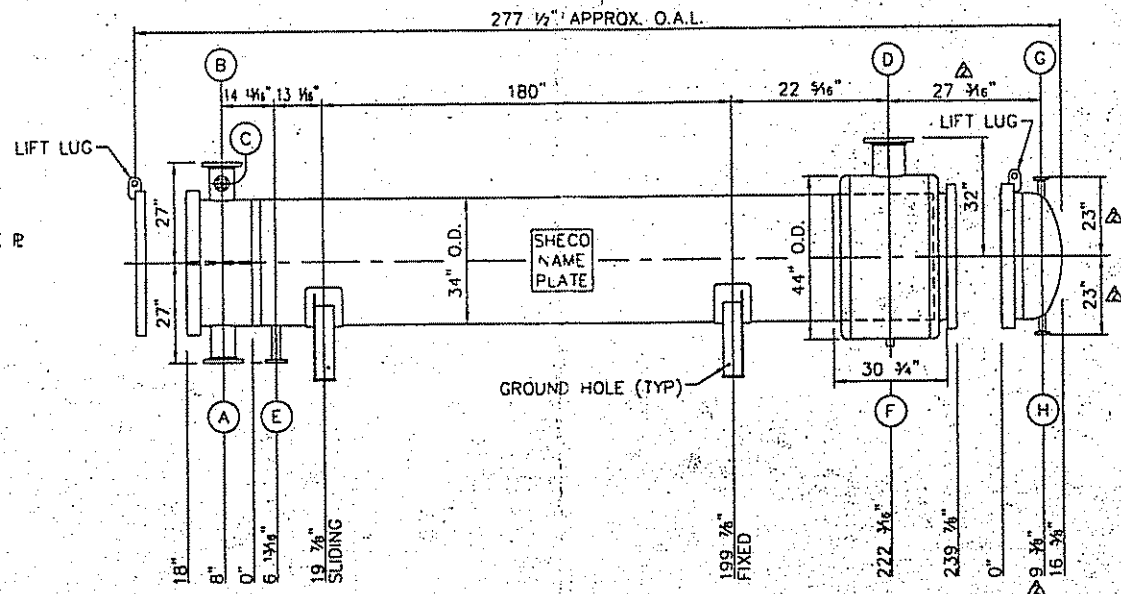
DATE 12/28/99 ORDER NO. DWG. NO. SB-4179-2

BY J.D. Crowder 99-424A/B SHEET 1 OF 5

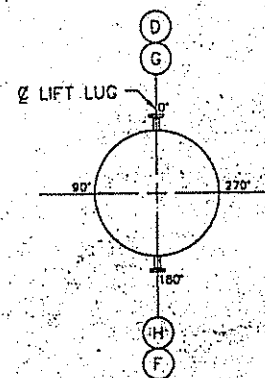
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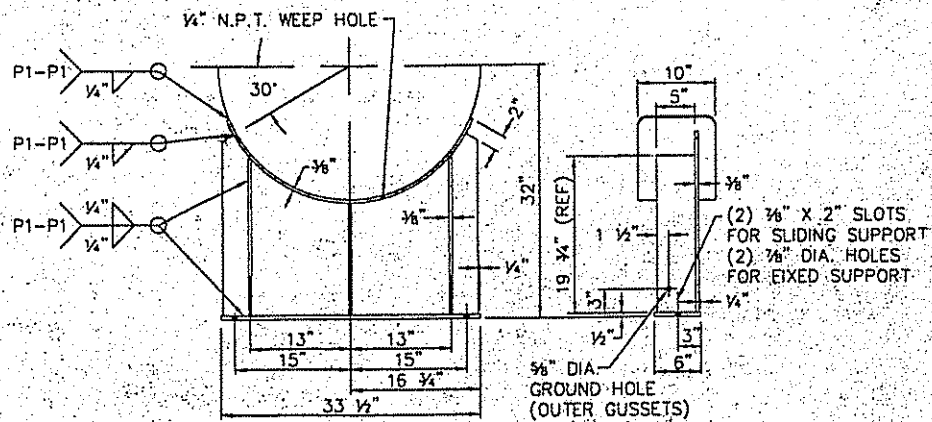
ORIENTATION



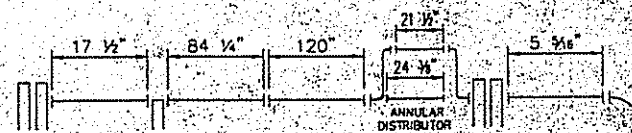
ELEVATION



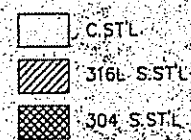
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SUPPORT DETAIL

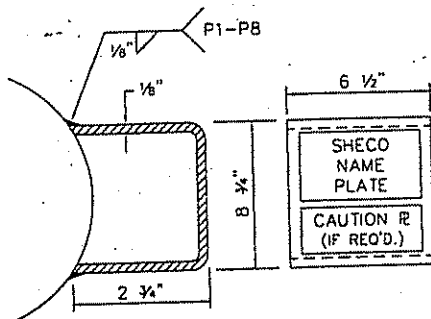


THEORETICAL COURSE LENGTH

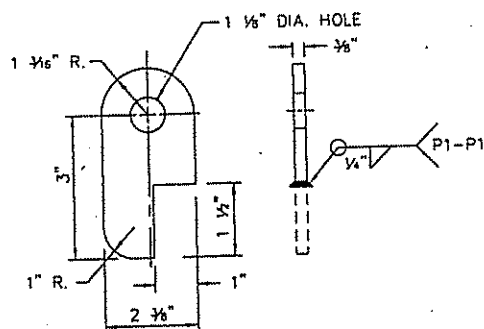


CERTIFIED	ENG. 0003/28/00
CUSTOMER	KOSA
CUSTOMER P.O. NO.	4500262721
ITEM NO.	E-4207-4/E-6207-4
PLANT	WILMINGTON, NC
ITEM SIZE AND TYPE	
(2) 33-240 NEM. C & D-LINES ACID WASTE WATER REBOILERS	
SOUTHERN HEAT EXCHANGER CORP.	
P.O. BOX 1850 TUSCALOOSA, AL 35403	
DATE 12/28/99	ORDER NO.
BY J.D. Crowder	99-424A/B
DWG. NO. SB-4179-2	SHEET 2 OF 5

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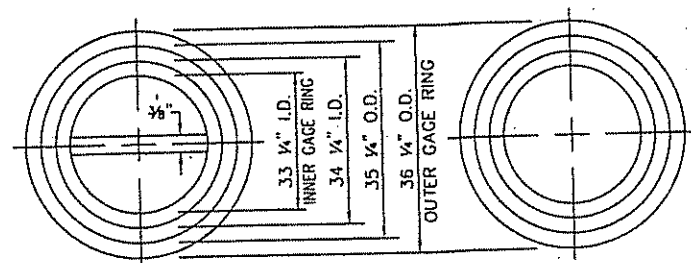


NAME PLATE BRACKET DETAIL



LIFT LUG DETAIL

( 2 ) REQ'D



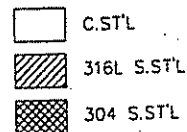
LEFT CHANNEL  
(2) REQ'D.

RIGHT BONNET  
(2) REQ'D.

GASKET DETAIL

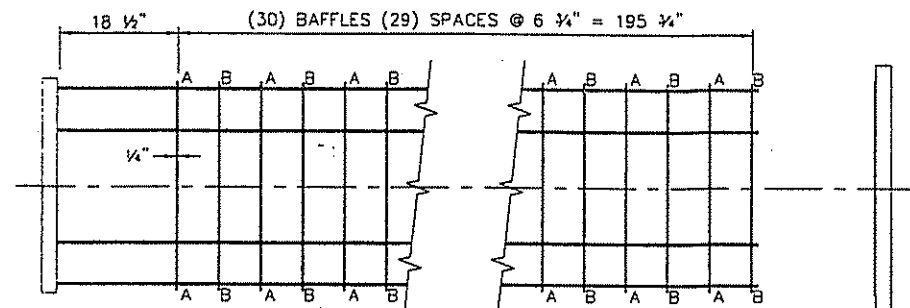
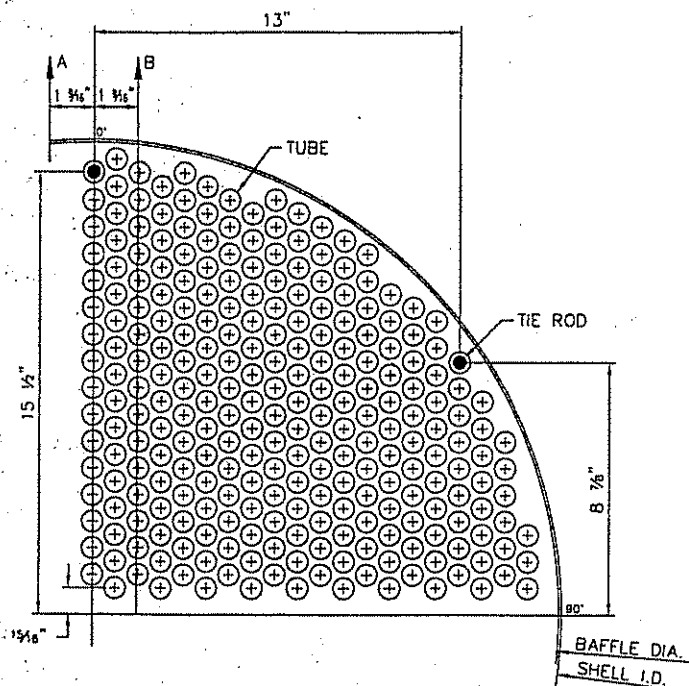
(INCLUDES ONE SPARE SET)

0.175" THK. 316L S.ST'L SPIRAL WOUND GASKET WITH TEFLON FILLER, 316L S.ST'L DOUBLE JACKETED PASS RIBS, AND 1/8" THK. C.ST'L OUTER GAGE RING & 316L S.ST'L INNER GAGE RING.



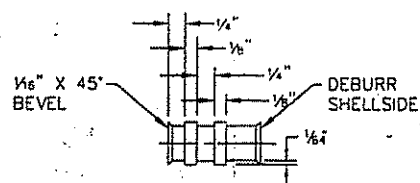
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CUSTOMER KOSA		
CUSTOMER P.O. NO. 4500262721		
ITEM NO. E-4207-4/E-6207-4		
PLANT WILMINGTON, NC		
TEMA SIZE AND TYPE		
(2) 33-240 NEM C & D-LINES ACID WASTE WATER REBOILERS		
SOUTHERN HEAT EXCHANGER CORP.		
P.O. BOX 1850 TUSCALOOSA, AL. 35403		
DATE 12/28/99	ORDER NO. 99-424A/B	DWG. NO. SB-4179-2
BY J.D. Crowder		SHEET 5 OF 5

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BUNDLE DETAIL

TUBE O.D.	3/4"
NO OF TUBE HOLES	994
SIZE OF TUBE HOLE IN TUBESHEET	0.760"
SIZE OF TUBE HOLE IN BAFFLE	25/32"
PITCH	1 3/16" 30°
TIE ROD O.D.	1/2"
NO. OF TIE RODS	6
TIE ROD HOLE SIZE IN TUBESHEET	9/16" x 1/2" DP. (SEAL WELD)
TIE ROD HOLE SIZE IN BAFFLE	9/16"
SPACER O.D.	3/4"
DUMMY TUBE O.D.	-
NO. OF DUMMY TUBES	-
DUMMY TUBE HOLE SIZE IN BAFFLES	-
O.T.L.	32.6939"
BAFFLE DIA.	33.0625"
BAFFLE CUT ALTERNATES	(15) A-A, (15) B-B



TUBE HOLE DETAIL

	C.S.T'L
	316L S.S.T'L
	304 S.S.T'L

CERTIFIED	ENG. <i>0003/28/00</i>	
CUSTOMER KOSA		
CUSTOMER P.O. NO. 4500262721		
ITEM NO: E-4207-4/E-6207-4		
PLANT WILMINGTON, NC		
TEMA SIZE AND TYPE		
(2) 33-240 NEM C & D-LINES ACID WASTE WATER REBOILERS		
SOUTHERN HEAT EXCHANGER CORP.		
P.O. BOX 1850 TUSCALOOSA, AL. 35403		
DATE 12/28/99	ORDER NO.	DWG. NO. SB-4179-2
BY J.D. Crowder	99-424A/B	SHEET 4 OF 5

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