

## SHELL &amp; TUBE HEAT EXCHANGER DATA SHEET ADJ. A SAL-412

REVISION BY DATE	1.	2.	3.	4.	5.	6.	7.	8.
SERVICE OF UNIT	OVERHEAD CONDENSER TAG NO. 2-E-311							
MANUFACTURER								
SIZE	TYPE A - <input type="checkbox"/> - S		HORIZONTAL CONNECTED HT					
SQ. FT. SURF./UNIT (GROSS)	SHELLS/UNIT ONE		SQ. FT. SURF./SHELL (GROSS)					
PERFORMANCE OF ONE UNIT								
			SHELL SIDE			TUBE SIDE		
FLUID CIRCULATED			VAC. RERUN TWR. OVERHEAD			COOLING WATER		
TOTAL FLUID FLOWING			5,194 LB/HR			35,810 LB/HR		
VAPOR			4,813 LB/HR			LB/HR		
LIQUID			LB/HR			35,810 LB/HR		
STEAM			355 LB/HR			LB/HR		
NON-CONDENSABLES			26 (MW = 43.6) LB/HR			LB/HR		
FLUID VAPORIZED OR CONDENSED			4,813 LB/HR			LB/HR		
STEAM CONDENSED			LB/HR			LB/HR		
GRAVITY °API			28.5					
VISCOSITY CKS			0.97 @ 500°F 25.0 @ 120°F			CP		
MOLECULAR WEIGHT			IN = 151.6 OUT = 18.75					
SPECIFIC HEAT			BTU/LB.°F			BTU/LB.°F		
THERMAL CONDUCTIVITY			BTU/HR-FT.°F			BTU/HR-FT.°F		
LATENT HEAT			BTU/LB			BTU/LB		
TEMPERATURE IN			500 °F			75 °F		
TEMPERATURE OUT			120 °F			120 °F		
OPERATING PRESSURE			85 mm Hg ABS.			45 PSIG		
NO. OF PASSES PER SHELL			(1)			(1)		
VELOCITY			FT/SEC			0.38 FT/SEC		
PRESSURE DROP—ALLOW./CALC.			15 mm Hg. PSI			10 PSI PSI		
FOULING RESISTANCE (MIN.)			0.002			0.002		
HEAT EXCHANGED—BTU/HR			1,611,520			MTD CORRECTED—°F (1)		
TRANSFER RATE—SERVICE			25 (MINIMUM) CLEAN					
CONSTRUCTION OF ONE SHELL								
DESIGN PRESSURE			FULL VACUUM @ 25 PSIG			75 PSIG		
TEST PRESSURE			PER CODE PSIG			PER CODE PSIG		
DESIGN TEMPERATURE			550 °F			170 °F		
TUBES C-STL NO.			O.D. 3/4" BWG 12			LENGTH 12' FITCH 1" (1)		
SHELL KILLED-STEEL D.			O.D.			SHELL COVER KILLED STEEL (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)		
CHANNEL OR BONNET C-STL						CHANNEL COVER C-STEEL		
TUBESHEET—STATIONARY KILLED STEEL						TUBESHEET—FLOATING KILLED STEEL		
RAFFLES—CROSS C-STL TYPE SEGA.						FLOATING HEAD COVER KILLED STEEL		
RAFFLES—LONG TYPE						IMPROVEMENT PROTECTION		
TUBE SUPPORTS								
TUBE-TO-TUBESHEET JOINT								
GASKETS—SHELL SIDE			TUBE SIDE					
CONNECTIONS—SHELL SIDE			IN (1) (2) OUT (1) (2)			SERIES 150 # RF		
CHANNEL SIDE			IN (1) (2) OUT (1) (2)			SERIES 150 # RF		
CORROSION ALLOWANCE—SHELL SIDE			1/8"			TUBE SIDE 1/8"		
WEIGHTS—EACH SHELL			FUNDLE			TALL OF WATER		
CODE REQUIREMENTS ASME VIII DIV. I, FW 12570-21A1						TEMA CLASS R		
NOTE: AFTER EACH PART INDICATE WHETHER STRESS RELIEVED (S.R.) AND WHETHER RADIOGRAPHED (X.R.)								
REMARKS: (1) VENDOR TO DETERMINE								
(2) SHELL SIDE LINE IN : 16" SHELL SIDE LINE OUT : 10"								
TUBE SIDE LINE IN : 3" TUBE SIDE LINE OUT : 3"								
(3) INSULATION : SHELL SIDE 1/2" - TUBE SIDE 1/2" (BY OTHERS)								
MADE BY								
CHECKED BY								
PAGE 13 OF								
CONTR. NO. AG 85/86 BIA NO. E-102/C								



# LISTA DE MATERIALES

POSIC.	PLANO Nº	CANT.	UNID.	DESCRIPCION	MATERIAL	DIMENS. EN BRUTO	REQUIS.		O/COMP.		PROVEED.	FECHA LLEGADA		VALE Nº	OBSERVACIONES
							Nº	Fecha	Nº	Fecha		PREV.	REAL		
* 1	11.1121.3	1		PLACA $\phi$ 502 ESPESOR 28	SA.181.Gr II	MECANIZAR		SEGUN PLANO							
* 2	"	148		TUBO $\phi$ 3/4" BWG:12 LARGO 3718	SA-179										312222
3	"	4		CHAPA $\phi$ 434.6 ESPESOR:9.5	SAE 1010	MECANIZAR		3/PLANO							495040
4	"	4		CHAPA $\phi$ 434.6 ESPESOR:9.5	SAE 1010	MECANIZAR		3/PLANO							495040
5	"	1		CHAPA $\phi$ 434.6 ESPESOR:9.5	SAE 1010	MECANIZAR		3/PLANO							495040
6	"	6		VARILLA $\phi$ 3/8" L:3530	SAE 1010	MECANIZAR		3/PLANO							308464
7	"	8		SEPARADOR CAÑO $\phi$ 3/8" SCH 40 L:692	SA-53-Gr A										316046
8	"	12		TUERCA $\phi$ 3/8" ROSCA W. EXAG.	ACERO PUDD										164464
* 9	"	1		PLACA $\phi$ 476 ESPESOR: 26	SA.181.Gr II	MECANIZAR		3/PLANO							
10	"	16		CAÑO $\phi$ 3/8" SCH:40 L:341	SA-53-Gr A										316046
11	"	2		CAÑO $\phi$ 3/8" SCH:40 L:1043	"										316046
12	"	8		CAÑO $\phi$ 3/8" SCH:40 L:490	"										316046
13	"	4		CAÑO $\phi$ 3/8" SCH:40 L:841	"										316046
14	"	2		TAPON $\phi$ 5/8" UNC L:22	SA-105										
				MATERIAL PARA REPUESTO											
		8		TUBOS $\phi$ 3/4" BWG:12 LARGO:3718	SA-179										312222

A. G. McKee & Co.  
 Checked for General Design & Control by \_\_\_\_\_  
 This Approval does not constitute a warranty for the use of the material for purposes other than those intended.  
 for Construction of Design, Detail and Cost  
 1 - APPROVED  
 2 - APPROVED WITH CORRECTION  
 3 - CORRECT & ISSUE NEW PRINT  
 (MOLD) PROCEED WITH FABRICATION  
 By \_\_\_\_\_ Date: DEC 22, 77

## NOTAS

\* ADQUIRIDO POR LISTA DE MATERIALES CRITICOS 11.1121.1  
 ALTERNATIVA SA.181.Gr II o SA.105

CLIENTE: Y.P.F.B. Mc Kee  
 (CUSTOMER)

O.C.Nº: LUB.309  
 (P.O.Nº)

MAZO DE TUBOS MARCA: TAG..2E-311  
 OVERHEAD CONDENSER

ESC. DIB. L.V.P. REV. A. Ruiz APR. 28 REF. PLANO



CASES INDUSTRIALES

S. A. T. I. C.

A-3

1121

8

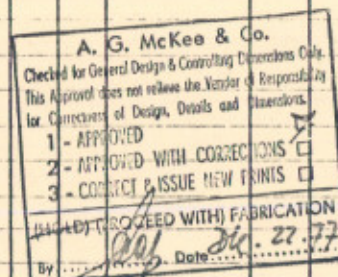
1

1	MODIFICADO MATERIAL POS. 1-9 ERA SA.181.Gr I EN SA.181.Gr II	6-12-77	L.V.P.
2	ADPTO PARA ADQUIRIR	14-10-77	L.V.P.
Nº	MODIFICACION	FECHA	POR



# LISTA DE MATERIALES

POSIC.	PLANO Nº	CANT.	UNID.	DESCRIPCION	MATERIAL	DIMENS. EN BRUTO	REQUIS.		O. COMP.		PROVEED.	FECHA LLEGADA		VALE Nº	OBSERVACIONES
							Nº	Fecha	Nº	Fecha		PREV.	REAL		
1	A1.1121.2	4		REMACHE ALUMINIO $\phi$ 3.5 LARGO: 8mm	ALUMINIO										—
2	A2.1121.6	1		PLACA DE IDENTIFICACION. 150 x 137 ESP: 2	ACERO INOX.										—
3	A2.1121.6	1		CHAPA ESPESOR: 3 400 x 157	SAE 1010										495003
4	A1.1121.2	1		TAPA ESPESOR 48 $\phi$ 575	SA. 181.Gr II	x									—
5	"	5		VARILLA $\phi$ 9.5 LARGO: 200	SAE. 1010										—
6	"	3		BRIDA $\phi$ 17" 150# SEGUN TEMA "E"	SA. 181.Gr II	TIPO I - W.N. Y									—
				$\phi_e = 575 - \phi_i = 438 - \phi_{\text{varilla}} = 505$											—
				$\phi_{\text{circulo bulones}} = 533 - \text{NÚMERO AGUJEROS}$											—
				20 - $\phi$ AGUJEROS: 22											—
7	"	1		VIROLA $\phi_e = 457$ ESPESOR: 9.5 LARGO: 260	SA. 515 - Gr 70	x									495633
8	"	2		CAÑO $\phi_N = 3"$ SCH 80 LARGO: 260	SA. 106.Gr B										315280
9	"	2		BRIDA $\phi_N 3"$ SORF 150#	SA. 181.Gr II	y									—
10	"	2		BRIDA $\phi_N 8"$ SORF 150#	SA. 181.Gr II	y									—
11	"	2		CAÑO $\phi_N 8"$ SCH 40 LARGO: 260	SA. 106.Gr B										315464
12	"	1		VIROLA $\phi_e = 457$ ESPESOR: 9.5 LARGO: 1500	SA. 515 - Gr 70	x									—
13	"	1		VIROLA $\phi_e = 457$ ESPESOR: 9.5 LARGO: 396	SA. 515 - Gr 70	x									495633
14	"	1		VIROLA $\phi_e = 457$ ESPESOR: 9.5 LARGO: 1500	SA. 515 - Gr 70	y									—
15	"	2		CHAPA ESPESOR: 9.5 150 x 780	SA. 815 - Gr 70	x									495633
16	"	2		CHAPA ESPESOR: 12.7 430 x 383	SAE. 1010										495051
17	"	2		CHAPA ESPESOR: 12.7 92 x 249	SAE. 1010										495051
18	"	1		CHAPA ESPESOR: 12.7 105 x 430	SAE. 1010	MECANIZADO SEGUN PLANO									495051
19	"	1		CHAPA ESPESOR: 12.7 105 x 430	SAE. 1010	"									495051
20	"	1		CAÑO $\phi_N 10"$ SCH 40 LARGO: 260	SA. 106.Gr B										315556
21	"	1		BRIDA $\phi_N 10"$ SORF 150#	SA. 181.Gr II	y									—
22	"	1		BRIDA $\phi$ 17" 150# SEGUN TEMA "E"	SA. 181.Gr II	TIPO II W.N. Y									—
				$\phi_e = 683 - \phi_i = 438 - \phi_{\text{varilla}} = 610$											—



## NOTAS

\* ADQUIRIDOS CON LISTA DE MATERIALES CRITICOS A3.1121.1

ALTERNATIVA SA. 181.Gr II & SA. 105

CLIENTE: Y.P.F.B. Mc Kee  
(CUSTOMER)

O.C. Nº: LUB-309  
(P.O.Nº)

ENVOLVENTE - MARCA: TAG-2E-311  
OVERHEAD CONDENSER

ESC.

DIB. L. V. P

REV. A. R. 12

APR.

REF. PLANO



GASES INDUSTRIALES

S. A. T. I. C.

A-3

1121

4 1/3

1	MODIF. MATERIAL	ERA: SA. 181.Gr I	ES: SA. 181.Gr II	ERA: SA. 285.Gr C	ES: SA. 515.Gr 70	6-12-77	L. V. P.
2	ADPTO PARA ADQUIRIR.					13-10-77	L. V. P.
Nº	MODIFICACION					FECHA	POR



# LISTA DE MATERIALES

POSIC.	PLANO Nº	CANT.	UNID.	DESCRIPCION	MATERIAL	DIMENS. EN BRUTO	REQUIS.		O/COMP.		PROVEED.	FECHA LLEGADA		VALE Nº	OBSERVACIONES
							Nº	Fecha	Nº	Fecha		PREV.	REAL		
	11.121.2			Φ CIRC. BULONES: 641. Φ AGUJEROS 22. CANT. AGUJEROS: 24.											—
23	"	1		BRIDA Φ N 21" 150" SEGUN TEMA "R" Φ ext: 683. Φ int: 540. Φ REBATE: 610. Φ CIRC. BULONES: 641. NÚMERO DE AGUJEROS: 24. Φ AGUJEROS 22.	SA. 181. Gr II	TPD: III. WIN.	X								—
24	"	2		CUPLA Φ N 3/4" NPT 6000"	SA. 105										120175
25	"	20		ESPARRAGO Φ N 3/4" UNC 1/2 TUERCAS LARGO: 150	SA. 193. B7 SA. 194. 2H										667273
26	"	1		WROTA Φ e = 559. ESPESOR: 9.5 LARGO: 203	SA. 234. WPB		X								495633
27	"	1		CASQUETE SEMIELIPTICO R: 2:1 Φ e = 559 ESPESOR: 9.5	SA. 234. WPB		X								132241
28	"	1		ANILLO Φ e = 524 Φ i = 413 esp: 64	SA. 181. Gr II	MECANIZADO SEGUN PLANO									—
29	"	1		FUBIDO BOMBÉ Φ e = 410 e = 12.7 RADIO DE CURVATURA: 305	SA. 234. WPB		X								—
30	"	1		ANILLO PARTIDO EN DOS MITADES Φ e = 524 Φ i = 413 esp: 32	SA. 181. Gr II	MECANIZADO SEGUN PLANO									—
31	"	1		ANILLO SEPARADOR Φ e = 524 e = 19 ANCHO 15.9	SAE 1010										495073
32	"	3		CHAPA ESPESOR: 6 25 x 10	SAE 1010										495025
33	"	1		CHAPA ESPESOR 9.5 384 x 438	SAE 1010										495040
34	"	20		ESPARRAGO Φ 3/4" UNC 1/2 TUERCAS LARGO: 150	SA. 193. B7 SA. 194. 2H										667273
35	"	24		ESPARRAGO Φ 3/4" UNC 1/2 TUERCAS LARGO: 150	SA. 193. B7 SA. 194. 2H										667273
36	"	2		TAPON Φ 3/4" NPT TIPO BARROTE	SA. 105										—
37	"	12		ESPARRAGO Φ 3/4" UNC 1/2 TUERCAS LARGO: 160	SA. 193. B7 SA. 194. 2H										667284

A. G. McKee & Co.  
Checked for General Design & Correcting Dimensions Only.  
This Approval does not relieve the Designer of responsibility for Completion of Design, Detail and Construction.

1 - APPROVED ☒  
2 - APPROVED WITH COMMENTS ☐  
3 - CORRECTED ISSUE ☐  
(NOT) REDUCED WITH FABRICATION  
By: *REP* Date: *Dec 22-77*

## NOTAS

\* ADQUIRIDO CON LISTA DE MATERIALES CRITICOS 13.1121.1

ALTERNATIVA SA. 181. Gr II o SA. 105

CLIENTE: Y.P.F.B. Mc Kee  
(CUSTOMER)

O.C. Nº: LUB-309  
(P.O.Nº)

ENVOLVENTE. MARCA: TAG. 2E-311  
OVERHEAD CONDENSER

ESC.

DIB. L.V.P.

REV. A RJ 12

APR.

REF. PLANO



GASES INDUSTRIALES

S. A. T. I. C.

A-3

1121

4 2/3

2.1

1 MOD MATERIAL ERA: SA. 181. Gr II - ES: SA. 181. Gr II - ERA: SA. 234. WPB - ES: SA. 234. WPB - ERA: SA. 234. WPB - ES: SA. 234. WPB

0 APTO PARA ADQUIRIR.

Nº MODIFICACION

FECHA

POR

6.12.77 L.V.P.

13.10.77 L.V.P.



# LISTA DE MATERIALES

POSIC.	PLANO Nº	CANT.	UNID.	DESCRIPCION	MATERIAL	DIMENS. EN BRUTO	REQUIS.		O. COMP.		PROVEED.	FECHA LLEGADA		VALE Nº	OBSERVACIONES
							Nº	Fecha	Nº	Fecha		PREV.	REAL		
		13		ESPARRAGO $\phi 3/4$ UNC $1/2$ TUERCAS LARGO: 150	SA. 193. B7 SA. 194. 2H										667273
		3		ESPARRAGO $\phi 3/4$ UNC $1/2$ TUERCAS LARGO: 160	SA. 193. B7 SA. 194. 2H				"						667284
		1		BRIDA ANILLO PARTIDO $\phi 524. \phi 413$ ESPESOR: 32 MECANIZADA POS: 30	SA. 181. Gr II		X		"						

A. G. McKee & Co.

Checked for General Design & Manufacturing Dimensions Only  
This Approval does not release the Vendor of Responsibility  
for Conformance with Design, Details and Dimensions

1 - REVIEWED

2 - APPROVED WITH CORRECTIONS

3 - CORRECT & ISSUE FOR PRINTING

RECEIVED WITH FABRICATION

By *[Signature]* Date *Dec. 22-77*

**A. G. McKee & Co.**  
 Checked for General Design & Controlling Dimensions Only  
 This Approval does not release the Vendor of Responsibility  
 for Conformity to Design, Details and Dimensions.

1 - APPROVED ☒  
 2 - APPROVED WITH CONNECTIONS ☐  
 3 - APPROVED WITH ISSUE IN PRINTS ☐

WE WILL PROCEED WITH FABRICATION  
 By *[Signature]* Date *26.2.77*

NOTAS  
 ADQUIRIDO CON LISTA DE MAT. CRÍTICO AL 1121.1

ALTERNATIVA SA. 181. Gr II o SA. 105

CLIENTE: Y.P.F.B. Mc. Kee  
 (CUSTOMER)

O. C. Nº: LUB-309  
 (P.O.Nº)

ENVOLVENTE. MARCA: TAG 2E-311  
 OVERHEAT CONDENSER

ESC. DIB. L. V. P. REV. A. R. J. T. APR. REF. PLANO

**G CASES INDUSTRIALES** A-3 1121 4 <sup>3</sup>/<sub>3</sub>  
 S. A. T. I. C.

2	MODIFIC. MATERIAL ERA: SA. 181. Gr I es SA. 181. Gr II	6.12.77	L.V.P.
1	APTO PARA ADQUIRIR	13-10-77	L.V.P.
Nº	MODIFICACION	FECHA	POR