Stearns-Roger

PURCHASE ORDEI

PAGE NO.	SHELL & TUBE, INC.	ORDER NO.
11	c/o Boyd-Loyd Engineering & Sales	R208 C11150

CODE NO.	ITEM	QUANTITY	DESCRIPTION	UNIT PRICE
			TAG ACCT: 41D28508 ABSORPTION TOWER TRAY NO. 8 HEAT EXCHANGER	
	11	1	HEAT EXCHANGER, Absorption Tower Tray No. 8, size 19-360 Type BFM, horizontal mounted, consisting of 1 A53-B shell, 20" nominal outside diameter by 30', 300 A249-T316 ELC tubes, 3/4" outside diameter by 30', 1,738 sq. ft. surface per shell and in accordance with Specification No. 41D28508 Rev. D dated Dec. 8/72.	
**			Nozzle connections to be arranged as follows: Tube Side - Inlet on bottom, outlet on top and without any auxiliary couplings or connections. Shell Side - Inlet on top, outlet on bottom (both on channel end) and with: One (1) 1", 6,000 lbs. carbon steel coupling with plug at rear end bottom for drain. One (1) 1", 6,000 lbs. carbon steel coupling with plug on top approx. 7' from front tube sheet for thermal relief valve.	
**			Wt: 8,000 lbs. ea.	Ea

BUYER:

IMPORTANT: ORDER AND ACCOUNT NUMBERS MUST APPEAR ON ALL INVOICES AND SHIPPING DOCUMENTS, PACKAGES AND CORRESPONDENCE

DIRECT CORRESPONDENCE TO:

K III - 7-71

Form 1.21

(004)

HEAT EXCHANGERS

Stearns-Roger

ITEM NO. 41D 28508
ACCT.
PAGE 1 of 1
JOB NO. C-11150

CUSTOMER American Smelting and Refining Co.
PROJECT SO Plant
LOCATION Tacoma, Washington

DATE 6-23-71 BY JDF
REV. a 10-20-71 BY VKK
b 3-2-72 By VKK
c 6-28-72 By VKK
d 12-8-72 By VKK

SERVICE Tray Cooler #8 (water reflux)
MANUFACTURER Shell & Tube Inc.
PROPOSAL OF 4-14-72 (T3224)
NO. OF UNITS 1 SHELLS PER UNIT 1 ARRANGEMENT
SIZE 19-300 TYPE BFM POSITION Horizontal
SURFACE PER UNIT 1738 SURFACE PER SHELL -

PERFORMANCE OF ONE UNIT

	SHELL SIDE		TUBE SIDE	
FLUID CIRCULATED	Cooling Water		DMA	
VAPOR #/HR.	IN	OUT	IN	OUT
MOLECULAR WEIGHT				
LIQUID #/HR.			384,700	
GRAVITY			0.96	
VISCOSITY (Centipoise)			1.2	1.2
STEAM #/HR.				
WATER #/HR.	184,000			
NON-CONDENSABLES #/HR.				
Specific Heat (Btu/#°F)			0.40	
Thermal Cond. (Btu/Hr. ft²°F/ft)			0.114	
TEMPERATURE IN °F.	70		80	
TEMPERATURE OUT °F.	75		74	
OPERATING PRESSURE P.S.I.G	40		35	
NUMBER OF PASSES PER SHELL	2		2	
VELOCITY FT./SEC.	3.0		5.2	
PRESSURE DROP P.S.I.	15 ALLOWED 10.7 CALC.		8 ALLOWED 8 CALC.	
FOULING RESISTANCE	.002		.001	

HEAT EXCHANGED-B.T.U./HR. 920,000 M.T.D. (CORRECTED) 4.5
TRANSFER RATE-SERVICE 118.1

CONSTRUCTION - EACH SHELL

DESIGN PRESSURE P.S.I.	75	150
TEST PRESSURE P.S.I.	112	225
DESIGN TEMPERATURE °F.	200	200
CORROSION ALLOWANCE	1/16"	-

CODE REQUIREMENTS ASME Section VIII & STAMP TEMA CLASS B
TUBES A249-T316 ELC NO. 300 O.D. 3/4" BWG. 18 LENGTH 30' PITCH Triangular 15/16"
SHELL A53-B I.D. O.D. 20" THICKNESS
SHELL COVER - FLOATING HEAD COVER -
CHANNEL A240-T316 ELC CHANNEL COVER A240 T316 ELC
TUBE SHEETS-STATIONARY A240-T316 ELC FLOATING -
BAFFLES-CROSS C.S. TYPE Segmental THICKNESS
BAFFLES-LONG C.S. TYPE Welded THICKNESS
REMOVABLE BUNDLE C.S. GASKETS Asbestos (Teflon Impreg.)
TUBE SUPPORTS C.S. THICKNESS -
CONNECTIONS-SHELL-IN 6" C.S. Std. Wall OUT 6" C.S. Std. Wall SERIES 150# R.F.
CHANNEL-IN 8" SCH 40S-T316 ELC OUT 8" SCH 40S-T316 ELC SERIES 150# Lap Joint
WEIGHTS-EACH SHELL AND BUNDLE BUNDLE ONLY FULL OF WATER
OVERALL LENGTH

(S.R.) INDICATES STRESS RELIEVING & (X.R.) INDICATES RADIOGRAPHING

REMARKS:-