

SPECIFICATION - HEAT EXCHANGER

GENERAL

ITEM NO.:	E-518	SERVICE:	BEER STRIPPER #1 REBOILER		
TYPE:	SHELL & TUBE TYPE NEN				
CODE:	TEMA B - ASME SECTION VIII		STAMP: IF REQUIRED		
DESIGN PRESS.:	PSIG (kPa)	SHELL:	60 (414) / FULL VAC.	TUBES:	75 (518) / FULL VAC.
DESIGN TEMP.:	°F (°C)	SHELL:	300 (149)	TUBES:	300 (149)
TUBES:	No., IN (mm), BWG (mm)	No:	504	SIZE:	1.5 (38) O.D.
	FT-IN (mm), IN (mm)	LENGTH:	32' - 10" (10,000)	PITCH:	2.25 (57.2) Triangular

PROCESS DATA

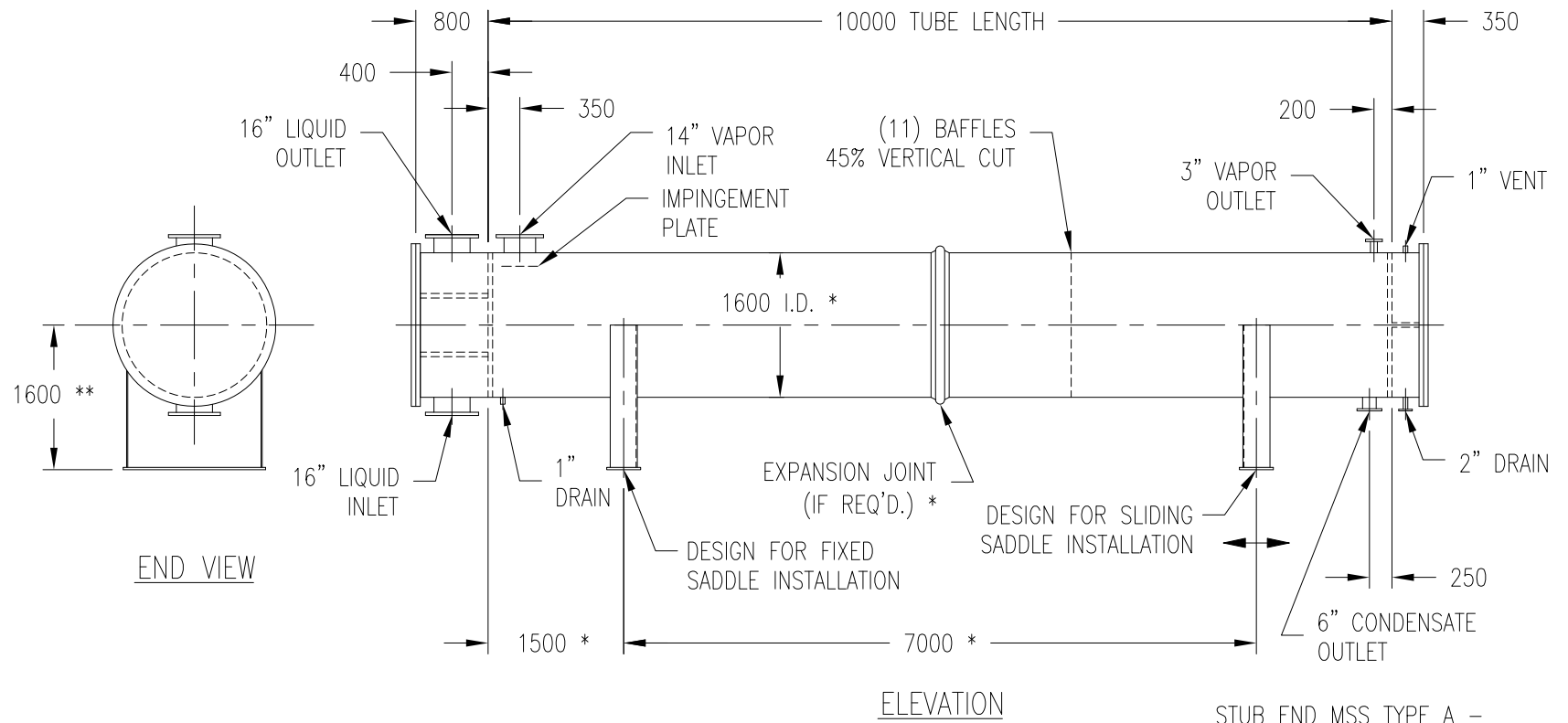
	SHELL SIDE	TUBE SIDE
FLUID CIRCULATED	ETHANOL/WATER VAPOR	STILLAGE
ENTERING VAPOR	20,530 (9,312)	
ENTERING LIQUID		2,416,727 (1,096,209)
ENTERING STEAM		
ENTER. NON-CONDEN.		
FLUID VAPOR. OR CONDEN.	20,530 (9,312)	
STEAM CONDENSED		
DENSITY	0.1 (1)	64.7 (1,037)
VISCOSITY-LIQUID/VAPOR	0.01 (0.00001)	2.00 (0.00200)
MOL. WT.-VAPORS		
SPECIFIC HEAT	Btu / (LB x °F) [kJ / (kg x K)]	0.88 (4)
LATENT HEAT-VAPOR	Btu/LB (kJ/kg)	675 (1,569)
TEMP. IN	°F (°C)	186 (85)
TEMP. OUT	°F (°C)	192 (89)
OPERATING PRESSURE	PSIA (kPa)	65 (347)
NO. OF PASSES	1	4
VELOCITY	FT/SEC (m/SEC)	8.0 (2.5)
PRESS. DROP	PSI (kPa)	20.7 (142.6)

SURFACE:	SQ. FT. (SQ. m)	6,493 (603)	SHELLS / UNIT:	1
HEAT EXCHANGED:	Btu/HR (kJ/HR)	13,849,000 (14,610,000)	MTD, °F (°C):	19.31 (10.73)
TRANSFER RATES:	Btu/(HR x FT² x °F)	DESIGN: 111 (2258)	CORRECTED	
	[kJ/(HR x M² x K)]	SERVICE: 129 (2625)	CLEAN:	360 (7337)

MATERIALS

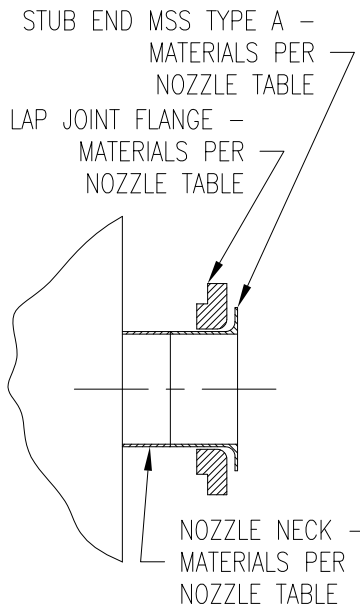
SHELL:	A240 TP-304L STAINLESS STEEL		
TUBES:	A249 TP-304L STAINLESS STEEL - AVERAGE WALL		
CHANNEL:	A240 TP-304L STAINLESS STEEL		
CHANNEL COVER:	A516 GR. 70 CARBON STEEL	LINER:	A240 TP-304L STAINLESS STEEL
TUBE SHEETS - STAT.:	A240 TP-304L STAINLESS STEEL		
TUBE SHEETS - FLOATING:	---		
FLOATING HEAD COVER:	---		
TUBE SUPPORTS:	---		
BAFFLES:	STAINLESS STEEL (11 REQUIRED) - 45 % VERTICAL CUT		
TIE RODS & SPACERS:	STAINLESS STEEL		
SUPPORTS:	CARBON STEEL W/ STAINLESS STEEL ISOLATION PADS		
EXPANSION JOINT:	IF REQUIRED		
GASKETS, IN (mm):	1/16" (2mm) NON-ASBESTOS		
BOLTING:	A193 B7 WITH A194 2H HEX NUTS		

	SHELL SIDE	TUBE SIDE
NOZZLES:		
NECK:	A312 TP-304L S. STL. PIPE	A312 TP-304L S. STL. PIPE
FLANGE:	A181 FORGED STEEL 150# LAP JOINT	A181 FORGED STEEL 150# LAP JOINT
COUPLING:	A182 F-304L S. STL. 3000# THR'D FULL	A182 F-304L S. STL. 3000# THR'D FULL
CORROSION ALLOWANCE:	IN (mm)	NONE



END VIEW

ELEVATION



TYPICAL NOZZLE DETAIL
WHERE LAP JOINT FLANGES
ARE CALLED FOR IN NOZZLE TABLE

- NOTES:**
- * - VENDOR TO SPECIFY/VERIFY.
 - ** - FINAL ELEVATION TO BE DETERMINED PER PIPING DESIGN.
 - 1. MAXIMUM TEMPERATURE ΔT FOR EXPANSION IS 300° F (149° C) SHELLSIDE AND 60° F (16° C) TUBESIDE.
 - 2. ALL EXTERNAL CARBON STEEL SURFACES TO BE CLEANED AND OTHERWISE PROPERLY PREPARED PRIOR TO APPLICATION OF ONE COAT OF CORROSION PROTECTION PRIMER PER SHOP STANDARD. FINAL PAINTING PER OWNER'S REQUIREMENTS.
 - 3. TUBESIDE - FOUR PASSES.
 - 4. PASS PARTITION TO WITHSTAND 75 PSI (345 kPa) ΔP.
 - 5. DAVITS REQUIRED ON EACH END.
 - 6. 304L SS MAY BE SUBSTITUTED WITH DUAL GRADE 304/304L SS.

NOZZLE SIZE	NOZZLE ** EXTENSION
1 1/4"-6"	150
8"-24"	200

** - UNLESS OTHERWISE SPECIFIED

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								BIOETANOL PAYSANDÚ			
										UTE ABENER TEYMA PAYSANDÚ	
0						Scale		Nº Plano:			
3/1/13						NONE		211,200 LITERS/DAY MOTOR FUEL GRADE ETHANOL PLANT		0003-PLN-KAT-05-62-0212	
REV. 0 ISSUE						Origin: JDC		EQUIPMENT SPECIFICATION		Sheets: 1 Sheet Nº: 1	
Description						ITEM: E-518		BEER PREHEATER #1 REBOILER		Client Nº: 1132-01 Dwg Nº: 05-212	
Dwn By						WLB					
Ckd By						JDC					
Appd By						JDC					