



HEAT EXCHANGER DESIGN, INC.

P. O. Box 524
Indianapolis, IN 46206-0524

Heat Exchanger Specification Sheet

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Customer		Job No.	
Address		Ref No.	
Plant Location		Proposal No.	
Service of Unit	Beer Column Condenser	Date	05/01/2007
Size	47x 240	Rev.	0
Surf/Unit (Eff)	4749 ft ²	Item No	
Type	AEM - HORZ	Connected in	1 Parallel
Shells/Unit	1	Surface/Shell (Effective)	4749 ft ²
			1 Series

PERFORMANCE OF ONE UNIT

		Shellside	Tubeside
1	Fluid Allocation		
2	Fluid Name	190 Proof Ethanol	Cooling Water
3	Total Fluid Entering	lb/hr	1,999,966
4	Vapor	128,726	0
5	Liquid	0	1,999,966
6	Steam		
7	Noncondensable		
8	Fluid Vaporized or Condensed	128,726	0
9	Liquid Density (In/Out)	lb/ft ³	62.125/61.770
10	Liquid Viscosity	cP	0.666
11	Liquid Specific Heat	Btu/lb-F	1.000
12	Liquid Thermal Conductivity	Btu/hr-ft-F	0.363
13	Vapor Mol. Weight (In/Out)		0.0/0.0
14	Vapor Viscosity	cP	0.0000
15	Vapor Specific Heat	Btu/lb-F	0.000
16	Vapor Thermal Conductivity	Btu/hr-ft-F	0.000
17	Temperature (In/Out)	°F	205.5/150.0
18	Operating Pressure	psi(Abs)	29.000
19	Velocity	ft/sec	67.246
20	Pressure Drop (Allow/Calc)	psi	6.000/5.245
21	Fouling resistance	hr-ft ² -F/Btu	0.000500

21	Heat Exchanged	57,330,480 Btu/hr	mtd (corr)	94.616 °F
22	Transfer Rate, Service	127.6	Clean	281.0 Btu/hr-ft ² -F

CONSTRUCTION OF ONE SHELL

		Shellside	Tubeside
25	Design/Test Pres. psi	75/Code	75/Code
26	Design Temp. °F	270	180
27	No. Passes per Shell	1	2
28	Corrosion Allow. in	0.0625	0.0625
29	Connections	In 1-24.0	20
30	Size &	Out 1-6.0	20
31	Rating	Intermediate 150 # RFSO	150 # RFSO

33	Tube No	920	OD 1.000 in	Thk 0.065	Length 20.00 ft	Pitch 1.25000 / 45.0°
34	Tube Type	PLAIN		Material	SA-214	
35	Shell	SA516-70	I.D 47.00 OD in	Shell Cover	N/A INT	
36	Channel or Bonnet	SA516-70		Channel Cover	N/A	
37	Tubesheet-Stationary	SA516-70		Tubesheet-Floating	N/A	
38	Floating Head Cover	N/A		Impingement Protection	NO	
39	Baffles Cross	A-36	Type VERT-SEG	%Cut 45.0 (Area)	Spacing-cc	19.6
40	Baffles-Long	N/A		Seal Type		
41	Supports-Tube	A-36	U-Bend	Type		
42	Bypass Seal Arrangement			Tube-Tubesheet Joint	Rolled Expanded	
43	Expansion Joint	N/A		Type		
44	Rho-V2 Inlet Nozzle	937	Bundle Entrance	2,895	Bundle Exit	814
45	Gasket-Shellside		Tubeside	DJNA	Floating Head	
46	Code Requirement	ASME Section 8, Division 1		TEMA Class	B	
47	Weight/Shell	25,407 #	Filled with Water	44,545 #	Bundle	N/A

48 Remarks: Hardware Bid Only / Tubes to be furnished by purchaser
 49 2. Parial support at inlet tubesheet. Inlet span = 40"
 50 3. Ave. Tube metal temp = 135.5 / Ave. Shell Temp = 158.2 F
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