



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 Reboiler	Date	05/01/2007
Size	72x 240	Item No	
Surf/Unit (Eff)	13687 ft ²	Shells/Unit	1
Type	BEM - HORZ	Connected in	1 Parallel
		Surface/Shell (Effective)	13687 ft ²
			1 Series

PERFORMANCE OF ONE UNIT

Fluid Allocation		Shellside	Tubeside
1	Fluid Name	Steam	Beer Column Bottoms
2	Total Fluid Entering	lb/hr	70,399
3	Vapor		70,399
4	Liquid		0
5	Steam		4,196,328
6	Noncondensable		
7	Fluid Vaporized or Condensed		70,399
8	Liquid Density (In/Out)	lb/ft ³	57.349/57.587
9	Liquid Viscosity	cP	0.198
10	Liquid Specific Heat	Btu/lb-F	1.002
11	Liquid Thermal Conductivity	Btu/hr-ft-F	0.395
12	Vapor Mol. Weight (In/Out)		18.0/18.0
13	Vapor Viscosity	cP	0.0152
14	Vapor Specific Heat	Btu/lb-F	0.573
15	Vapor Thermal Conductivity	Btu/hr-ft-F	0.017
16	Temperature (In/Out)	°F	284.6/277.3
17	Operating Pressure	psi(Abs)	52.935
18	Velocity	ft/sec	30.660
19	Pressure Drop (Allow/Calc)	psi	5.000/2.573
20	Fouling resistance	hr-ft ² -F/Btu	0.000500

21	Heat Exchanged	65,149,920 Btu/hr	mtd (corr)	22.121 °F
22	Transfer Rate, Service	215.2	Clean	373.1 Btu/hr-ft ² -F

CONSTRUCTION OF ONE SHELL

	Shellside	Tubeside	
25	Design/Test Pres. psi	75/Code	Maximum temperature difference = 70°F
26	Design Temp. °F	350	
27	No. Passes per Shell	1	
28	Corrosion Allow. in	0.0625	
29	Connections	1-12.0	
30	Size & Out	1-6.0	
31	Rating	Intermediate	
32		150 # RFSO	150 # RFSO/WOL

33	Tube No	2668	OD	1.000 in	Thk	0.049	Length	20.00 ft	Pitch	1.25000 / 30.0°	
34	Tube Type	PLAIN		Material	SA249-304L						
35	Shell	SA516-70	I.D	72.00	OD in	Shell Cover	N/A INT				
36	Channel or Bonnet	CS+WOL		Channel Cover	N/A						
37	Tubesheet-Stationary	CS+WOL		Tubesheet-Floating	N/A						
38	Floating Head Cover	N/A		Impingement Protection	YES						
39	Baffles Cross	A-36	Type	VERT-SEG	%Cut	45.0 (Area)	Spacing-cc	23.5			
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	4,939	Bundle Entrance	2,839	Bundle Exit	224					
45	Gasket-Shellside			Tubeside	DJNA	Floating Head					
46	Code Requirement	ASME Section 8, Division 1				TEMA Class	B				
47	Weight/Shell	51,404	Filled with Water	68,690	Bundle	N/A					

48 Remarks: Hardware Bid Only / Tubes to be furnished by purchaser
 49 2. First baffle to be 22" from the tubesheet, then keep baffles spacing at 24.5
 50 3. Ave. Tube metal temp = 272.1 / Ave. Shell Temp = 278.5 4/ All tubeside to be WOL or Lap Joint.
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