

**BROWN FINTUBE® COMPANY****SPECIFICATIONS FOR
HAIRPIN HEAT
EXCHANGERS**

P.O. Box 40082 12602 FM 529
Houston, Texas 77240-0082 Houston, Texas 77041
Phone: (713) 466-3535 Fax: (713) 466-3701

1 BFT Ref #: S.O.# 906299-D2-05 Date: 08/12/05
2 Customer: DICKSON & TRYER ENGR.CO., INC. Customer Ref #: P.O.# 1151-003SC
3 Address: MIDLAND, TEXAS Ultimate User: UNKNOWN
4 Plant Location: BARKSDALE, MS

5 Service of Unit: COLD GLYCEROL / GLYCEROL EXCHANGER Item No.: E-101 (CASE 2)
6 Section Type: 12276-MTB-AAJ No. Req'd: 3 Surf/Sec: 1298.3 Tot. Surf. 3894.8 ft.²
7 Arrangement: Shell: 3 Parallel x 1 Series Tube: 3 Parallel x 1 Series

SB 6(4)W(1.7) 47553/02

Performance of One Unit**Shellside****Tubeside**

8	Fluid Circulated		LEAN GLYCEROL		RICH GLYCEROL	
9	Total Fluid Flow Rate	lbm./hr.	58175.0		61165.9	
10			Liquid	Vapor	Liquid	Vapor
11	Flow Rate Entering	lbm./hr.	58175.0		60768.0	397.9
12	Flow Rate Leaving	lbm./hr.	58175.0		60578.0	587.9
13	Properties At Avg. Temp.	°F				
14	Specific Gravity		1.2		1.2	-----
15	Molecular Weight		-----		-----	43.11
16	Viscosity	centipoise	14.25		26.292	0.017
17	Specific Heat	btu./lbm. °F	0.677		0.663	0.221
18	Thermal Conductivity	btu./hr. ft. °F	0.179		0.1817	0.0144
19	Temperature In	°F	253.1		128.3	
20	Temperature Out	°F	163.8		215.0	
21	Inlet Pressure	lb./in. ² absolute	50.0		85.0	
22	Velocity	ft./sec.	0.78		1.29	
23	Pressure Drop	lb./in. ²	2.91		15.84	
24	Fouling (Minimum)	hr. ft. ² °F/btu.	0.002		0.002	
25						
26						

27 Heat Exchanged btu./hr. 3519400.0 X 1.15 M.T.D. (Corrected) 36.82 °F
28 Transfer Rate-Service: 28.22 Clean: btu./hr. ft.² °F

Construction**Shellside****Tubeside**

29	Design Pressure	lb./in. ²	150	150
30	Test Pressure	lb./in. ²	CODE	CODE
31	Design Temperature Min/Max	°F	-20 / 500	-100 / 500

** ORIGINAL CONTRACT **
By ENGR (BOB LITTLE)
On 10-SEP-2005 10:03:41.53

32 Tube: Mat'l.SA-249 TP316L (W) STN. STL. O.D.0.75 in. Wall Thk. 16 BWG.AW
33 Shell: Mat'l.C.S. SA-106-B (SMLS) O.D.12.75 in. Wall Thk. STD.WALL
34 Fin: Mat'l. N/A Hgt. N/A in. Thk. N/A in. No. per tube NONE
35 No. Tubes Req'd: 136 - U'S Nominal Length: 23.0 ft.
36 Tube Connectors: Mat'l N/A No. Req'd: NONE
37 Tube Closure Type: SEPARATED HEAD
38 Stacking Arrangements: 3 Wide 1 High
39 Gaskets: Shell Closure: SOFT IRON / IPC 5304 Tube Closure: TP 316L SS / IPC 5304
40 Shell In & Out: N/A Return Bonnet: GRAFOIL
41 Connections: Shell - In 3.0 in. Out 3.0 in. Series: 150 # Type: RFWN
42 Tube - In 3.0 in. Out 3.0 in. Series: 150 # Type: RFWN
43 Corrosion Allowance: Shellside 0.125 in. Tubeside ----- in. EXCEPT TUBES
44 Code Requirements: ASME CODE INSPECTED & STAMPED, SEC. VIII DIV.I; NATIONAL BOARD REGISTERED
45 Estimated Weight/Unit: Dry 10500 lb. Full of Water lb.

Remarks:

SEE CASE 1 FOR REMARKS