

93903?

John Brown E&C
Bridgewater, N. J.

JOB NO. 94037-00
PAGE NO. 1 OF 3
ACCT.NO. 4031

SHELL & TUBE HEAT EXCHANGER

ITEM NO.
E-16081

Requestion No.			Date		
94037-2151			SEP-30-94		
Rev	Date	By	Rev	Date	By
1	DEC.-05-94	LYW			
Client			FMC CORP		
Plant Location			BALTIMORE,MD		
1. Service of unit:		SOLVENT FLASH AFTER CONDENSER		No. Units Req'd: ONE	
2. Siz MODEL CKS2 10-81		Type: CYLIND. GRAPHITE BLOCK VERTICAL		Connected in Parallel One Series One	
3. Surf./Unit-Gross		58.1 Service side ft ² Shells/Unit ONE		Surf./Unit-Eff (ft ²) 58.1 Process side	
PERFORMANCE OF ONE UNIT					
5. Fluid Allocation			SHELLSIDE		TUBESIDE
6. Fluid name			TEMPERED 45% GLYCOL		TOLUENE, N2, H2O
7. Fluid			lb/hr 18 700		601
8. Vapor			lb/hr		171 TOLUENE
9. Liquid			lb/hr 18 700 (35 GPM)		
10. Steam			lb/hr		40
11. Non-Condensables			lb/hr		390 N2
12. Vaporized or Condensed			lb/hr		181 COND.
13. Inlet Pressure			psig 40		0.3
14. Velocity			ft/sec 2.4		31.4
15. DP Allow./calc.			psi 10		3.1
16. Temperature IN/OUT			°F 34 (1.1°C)		39.4 (4.1°C)
17. Viscosity			Cp 6		0.017
18. Specific Gravity			1.07		0.53 TOL
19. Specific Heat			Btu/lb°F 0.84		0.41 TOL
20. Thermal Conductivity			Btu/hr°Fft		0.014
21. Latent Heat (Vapor)			Btu/lb		182 TOLUENE
22. Molecular Wt Vapor					33.4
23. Fouling Resistance			hr°Fft ² /Btu 0.001		0.002
24. Heat Exchanged			84 840		Btu/hr MTD Corrected °F 41.8
25. Transfer Rate - Service			35		Clean 39.6 Btu/hr°Fft ²
26. CONSTRUCTION OF ONE SHELL			SHELL SIDE		TUBE SIDE
27. Design Pressure			psig 100/FV		100/FV
28. Test Pressure			psig PER CODE		PER CODE
29. Design Temperature			°F 350 (177°C)		350 (177°C)
NO. Passes			ONE		ONE
31. Corrosion Allowance			inch 1/16" ON C.S.		NONE
32. Connections IN /			/Series 2" - 150# R F		3" - 150# R F
33. OUT			/Series 2" - 150# R F		1.5" - 150# R F liq
34. Intermediate					3" - 150# R F vap
35. Tube No.:			Process Hole No. / I.D.: 104 / 0.315"		Length: Pitch: Degree:
36. Tube Type:			Note 1 Tube Material: 6 Graphite Blocks		Expansion Jt:
37. Shell: OD 10.75"			Material: C.S.		Shell Cover: (Integ) (Remov)
38. Channel or Bonnet:			Graphite		Channel Cover:
39. Tubesheet-Stationary:					Tubesheet-Floating:
40. Floating Head Cover					Impingement Protection: AS REQ'D
41. Baffles (Cross): C.S.			Type: %Cut(Dia):		Spacing C/C: Inlet:
42. Baffles (Long):			Seal Type:		Tubesheet Joint:
43. Supports-Tubes:					U-Bend Type:
44. Gaskets-Shell:			PTFE		Tube: PTFE Packing: EPDM
45. Code Requirements:			ASME Sec.VIII Div.1 stamped JB Spec. SS-438		TEMA Class:
46. Shipping Weight-Shell:			1 060 Filled with Water.		Bundle:
47. Remarks:			1. Teflon impregnated.		Made by: LYW
48.			2. See cooling curve on pgs. 2 & 3		John Brown
49.					Checked by: <i>[Signature]</i>
50. Vendor			KARBATE VICARB INC.		Purchase Order No.: 94037-21.51

