



SHELL AND TUBE HEAT EXCHANGER					Data Sheet No.:		DS-CL03A-E-300-E302		REV
NOTES:									
(*) Seller to specify or confirm.									
1) Seller shall verify and guarantee thermal rating of the unit.									
2) Fouling factors used for thermal rating are zero for both sides. Approximately 15% surface area is included in the design.									
3) Shellside shall include NPS 2 (300# RFLWN) vent. Vent shall be located at the centre full diameter baffle support plate.									
Trim top of central baffle support plate to allow non condensables from both sides to escape from the vent. Vent shall come complete with blind flange, gasket, bolts & nuts.									
4) Each process nozzle shall be provided with 1 - 1" RFLWN (complete with blind flange, gasket, bolts & nuts).									0A1
5) Full support at the U-bend tangent line shall be trimmed beyond the top and the bottom tube rows as much as possible.									
6) Exchanger is to be designed for future field hydrotest in the fully corroded condition.									
7) Exchanger to be designed for liquid full condition with SG=1.									
8) Seller is to design and install electrical heat tracing for hold temperature of 10°C. CSA approval is required for electric components and installation. The heat exchanger is located in a non-hazardous area.									
9) Seller is to supply and install 64 mm thick mineral fiber insulation.									
10) Seller to design tubesheet and girth flanges for gasket with an outer diameter of 1340 mm and inner diameter of 1305 mm.									
11) EHT design shall use voltage of 277 VAC.									
12) This document is designated for the Standard Package Catalogue per MEG Standard DMG-BAS-ST-0012.									0A1
BFW Analysis									

SHELL AND TUBE HEAT EXCHANGER					Data Sheet No.:		DS-CL03A-E-300-E302		REV
Service		BFW / MP Steam Condenser			Item No.		3A-E-302		0A1
Size	1225 x 4572	Type	AJ21U	(vert/horiz)	Horizontal	Connected In	1 Parallel	1 Series	
Mfr	SEWON Cellontech	Surf/Unit/ (Eff.)	304.7	m ² ; Shells/Unit	1	Surf/Shell (Eff.)	304.7	m ²	0A1
PERFORMANCE OF ONE UNIT (Min Duty Case)									
Fluid Allocation		IN Shell Side			OUT		IN Tube Side		OUT
Fluid Name		MP Steam					BFW		
Fluid Quantity, Total	kg/hr	36,112			36,112		1,081,404		1,081,404
Vapor (In / Out)	kg/hr	36,112			7,222		0		0
Liquid	kg/hr	0			28,889		1,081,404		1,081,404
Steam	kg/hr								
Water	kg/hr								
Non-Condensables	kg/hr								
Fluid Vaporized / Condensed	kg/hr								
Temperature	°C	198.3			197.3		156.8		168.9
Density (Liq./Vap.)	kg/m ³	- / 7.508			867.5 / 7.446		911.1 / -		899.2 / -
Viscosity (Liq./Vap.)	cP	- / 0.0156			0.136 / 0.0156		0.173 / -		0.160 / -
Molecular Weight (Vapor)		18.02			18.02				
Molecular Weight (Non-Condensable)									
Specific Heat (Liq./Vap.)	kJ/(kg·°C)	- / 2.808			4.485 / 2.808		4.324 / -		4.362 / -
Thermal Conductivity (Liq./Vap.)	W/(m·°C)	- / 0.0371			0.6664 / 0.0329		0.6852 / -		0.6815 / -
Latent Heat	kJ/kg								
Saturation temperature / dew point	°C								
Operating Pressure	kPaa	1485					2309		
Velocity	m/s	1.82					2.14		
Pressure Drop - Allowed / Calculated	kPa	15 /			1.1		70 /		32.5
Minimum Ambient Temperature	°C	-39					-39		
Fouling Resistance (Min.)	m ² ·°C/kW	(Note 2)					(Note 2)		
Heat Exchanged		15,661			kW: MTD Corrected		34.6		°C
Transfer Rate, Service	1481	Clean	5100.6		Actual		5100.6		W/(m ² ·°C)
					Sketch (Bundle / Nozzle Orientation)				
Design / Test Pressure		kPag				<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Refer to Page 1 for Details</p> </div>			
Design Temperature (MDMT/Max.)		°C							
No. Passes per Shell									
Corrosion Allowance		mm							
Connections		In							
Size (NPS) & Rating/ Facing		Out							
Intermediate									
Tubes	No.	OD	mm, Thk (Min/Avg.)	mm; Length	mm; Pitch	mm			
Tube Type				Material					
Shell		ID	OD			(Integ.)		(Remov.)	
Channel or Bonnet									
Tubesheet - Stationary									
Floating Head Cover									
No. of Cross Baffles	Type					Spacing: Center		mm Inlet	mm
Baffles - Long				Seal Type					
Tube Supports		U-Bend Support		Type					
Pairs of Seal Strips	Pass Lane Seal Rod No.			Tube-to-Tubesheet Joint					
Expansion Joint				Type					
ρ v ² - Inlet Nozzle		Bundle Entrance		Bundle Exit		kg/m-s ²			
Gaskets - Shell Side				Tube Side					
Floating Head				Channel Cover Davit					
Code Requirements				TEMA Class					
Weight / Shell		Filled with Water		Bundle		kg			
Radiographic Inspection:									
Notes:									
REVISIONS						 			
REV NO	DATE	BY	CHK	APP	DESCRIPTION	PROJECT	CLRP PHASE 3A CENTRAL PLANT FACILITY: EPC		
C	7-Dec-12	SS	CS	CS	Issued for Squad Check	JOB NO.	511036	TAG NO.	3A-E-302
D	28-Jan-13	SS	CS	CS	Issued for Quote	PAGE	3 of 3		
0	9-May-13	SS	SY / AH	CS	Issued for Purchase				
0A1	11-Feb-14	SS	SY	CS	Re-Issued for Purchase				