



Customer	XXXXXXXXXXXXXXXXXXXX	Reference No.	0203-1-HD
Address	XXXXXXXXXXXXXXXXXXXX	Proposal No.	DTM-203
Plant Location	Murcia (Spain)	Date	28/01/2015
Service of Unit	COLUMN CONDENSER (REBOILER)	Item	1
Size	438.2 - 692.2 x 1829 mm	Type	BKU
Surf/Unit (Gross/Eff)	18.21 / 17.96 m ²	Shell/Unit	1
		Surf/Shell (Gross/Eff)	18.21 / 17.96 m ²
		Connected In	1 Parallel
			1 Series

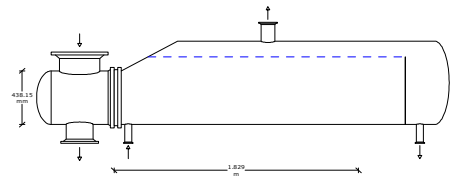
PERFORMANCE OF ONE UNIT

Fluid Allocation		Shell Side		Tube Side	
Fluid Name		Feedwater / LP Steam		Column Head (16-18 OH + N2)	
Fluid Quantity, Total	kg/h	1,067.3		3,302.2	
Vapor (In/Out)			533.6		44.58
Liquid		1,067.3	533.6	3,302.2	3,257.7
Steam			533.6		
Water		1,067.3	533.6		
Noncondensables				4.54	4.54
Temperature (In/Out)	C	153.10	152.88	213.34	186.29
Density	kg/m ³	914.08	2.75 V/L 914.09	0.55	0.51 V/L 675.76
Viscosity	mN-s/m ²	0.1785	0.0141 V/L 0.1785	0.0082	0.0082 V/L 0.3969
Molecular Weight, Vapor			18.0	215.0	215.0
Molecular Weight, Noncondensables				28.0	28.0
Specific Heat	kJ/kg-C	4.3186	2.4245 V/L 4.3185	2.3818	2.1906 V/L 2.7767
Thermal Conductivity	W/m-C	0.6835	0.0312 V/L 0.6835	0.0208	0.0208 V/L 0.1080
Latent Heat	kJ/kg		2,103.9		246.376
Inlet Pressure	kPa(a)	517.11		10.48	
Velocity	m/s	0.15		29.79	
Pressure Drop, Allow/Calc	kPa	0.10	0.04	3.50	3.50
Fouling Resistance (min)	m ² -K/W	0.000176		0.000176	
Heat Exchanged W	311,766	MTD (Corrected)		50.0 C	Overdesign 8.46%
Transfer Rate, Service	347.47 W/m ² -K	Clean	441.22 W/m ² -K	Actual	376.86 W/m ² -K

CONSTRUCTION OF ONE SHELL

Sketch (Bundle/Nozzle Orientation)

		Shell Side		Tube Side	
Design/Test Pressure	bar(g)	7 / FV	10	7 / FV	10
Design Temperature	C	-5	250	-5	250
No Passes per Shell		1		2	
Corrosion Allowance	mm	1.5		1.5	
Connections Size & Rating	In	1x2" WNRF 150#		1x12" WNRF 150#	
	Out	1x4" / 1x2" WNRF 150#		1x8" WNRF 150#	
	Others				



Tube No.	58U	OD	25.40 mm	Thk(AW)	2.11 mm	Length	1.829 m	Pitch	31.750 mm	Layout	30	
Tube Type	Plain / Welded			Material			SA-249 TP316L					
Shell	SA-312 TP316L			ID	438.2 - 692.2 mm		Shell Cover	SA-403 316L				
Channel / Bonnet	SA-312 TP316L / SA-403 316L			Channel Cover			N/A					
Tube-sheet-Stationary	SA-240 316L			Tube-sheet-Floating			N/A					
Floating Head Cover	N/A			Impingement device			None					
Baffles-Cross	Type	Full Support		%Cut (Diam)	N/A		Spacing(c/c)	450	Inlet	450 mm		
Baffles-Long	N/A	Seal Type		N/A								
Supports-Tube	N/A	U-Bend		Yes		Type	Full Support					
Bypass Seal Arrangement	N/A	Tube-Tubesheet Joint			Strength Welded + Hydraulic Expansion							
Expansion Joint	N/A	Type		N/A								
Rho-V2-Inlet Nozzle	Nil	Bundle Entrance		Nil		Bundle Exit	Nil		kg/m-s ²			
Gaskets-Shell Side	Grooved SS316L (+graphite)			Tube Side			Grooved SS316L (+graphite)					
-Floating Head	N/A											

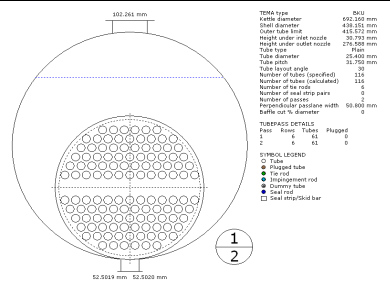
Code Requirements ASME VIII Div. 1 / TEMA R

Weight/Shell	1,070	Filled with Water	1,850	Bundle	300	kg
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Remarks:

- (1) - Channel: 18" Sch. 40s pipe / Shell: 28" Sch. 40s pipe
- (2) - Bonnet and shell covers made from pipe caps
- (3) - Estimated weights, to be confirmed during mechanical design

Tube layout:



Revision	0	1	2	3	4	5
Date	28/01/2015					
Generated	P.G.A.					
Reviewed	D.O.A.					
Approved	D.O.A.					