

Final Results

Released to the following HTRI Member Company:
seoeun engineering company
hkkang

Xist Ver. 6.00 SP3 2011-01-31 11:36 SN: 1500213756

MKH Units

Blowdown Overhead Condenser

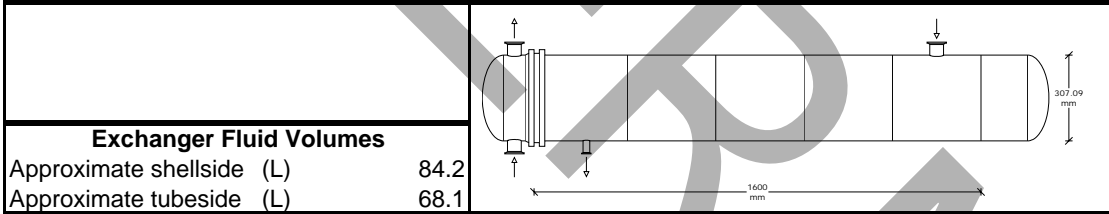
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Rating - Horizontal Multipass Flow TEMA BEU Shell With Single-Segmental Baffles

Process Data		Hot Shellside		Cold Tubeside	
Fluid name		Blowdown Overhead		Cooling Water	
Fluid condition		Cond. Vapor		Sens. Liquid	
Total flow rate	(1000-kg/hr)		0.2230 *		12.8774
Weight fraction vapor, In/Out	(--)	1.000	0.031	0.000	0.000
Temperature, In/Out	(Deg C)	164.00	55.00	32.00	42.00
Temperature, Average/Skin	(Deg C)	109.50	77.23	37.00	42.63
Wall temperature, Min/Max	(Deg C)	36.60	90.29	35.82	81.58
Pressure, In/Average	(kgf/cm2A)	6.733	6.731	7.033	6.937
Pressure drop, Total/Allowed	(kgf/cm2)	4.310e-3	0.200	0.193	0.700
Velocity, Mid/Max allow	(m/s)	8.747e-2		1.23	
Mole fraction inert	(--)		0.0000		
Average film coef.	(kcal/m2-hr-C)		412.01		5416.88
Heat transfer safety factor	(--)		1.000		1.000
Fouling resistance	(m2-hr-C/kcal)		0.000800		0.000400

Overall Performance Data

Overall coef., Req'd/Clean/Actual	(kcal/m2-hr-C)	212.97 /	354.01 /	241.57
Heat duty, Calculated/Specified	(MM kcal/hr)	0.1284 /	0.1118	
Effective overall temperature difference	(Deg C)	93.8		
EMTD = (MTD) * (DELTA) * (F/G/H)	(Deg C)	97.05 *	0.9662 *	1.0000



Exchanger Fluid Volumes

Approximate shellside (L)	84.2
Approximate tubeside (L)	68.1

Shell Construction Information

TEMA shell type	BEU	Shell ID	(mm)	307.086
Shells Series	1 Parallel 1	Total area	(m2)	6.511
Passes Shell	1 Tube 4	Eff. area	(m2/shell)	6.434
Shell orientation angle (deg)	0.00			
Impingement present	Circular plate	Impingement diameter/nozzle		1.1
Pairs seal strips	1	Passlane seal rods (mm)	19.050	No. 2
Shell expansion joint	No	Full support at U-Bend	Yes	
Weight estimation Wet/Dry/Bundle		510.31 /	358.12 /	120.56 (kg/shell)

Baffle Information

Type	Parallel Single-Seg.	Baffle cut (% dia)	32.42
Crosspasses/shellpass	5	No. (Pct Area)	(mm) to C.L
Central spacing	(mm) 316.187	1	29.33 53.975
Inlet spacing	(mm) 316.187	2	0.00 0.000
Outlet spacing	(mm) 316.187		
Baffle thickness	(mm) 4.763		

Tube Information

Tube type	Plain	Tubecount per shell	68
Length to tangent	(mm) 1600.	Pct tubes removed (both)	1.47
Effective length	(mm) 1581.	Outside diameter	(mm) 19.050
Total tubesheet	(mm) 19.050	Wall thickness	(mm) 2.110
Area ratio	(out/in) 1.2846	Pitch (mm)	25.4000 Ratio 1.3333
Tube metal	Stainless steel (18 Cr, 8 Ni)	Tube pattern (deg)	90