

PROJECT :			DATE :	
PROJ. NO. :			BY :	S.R. M.
CLIENT :			REV :	
UNIT :			DOC NO.:	

HORIZONTAL THREE PHASE SEPRATOR SIZING CALCULATION SHEET (BUCKET & PIPE)

Input Data	Unit	Vapor	Light Phase	Heavy Phase
Volumetric Flow Rate	m3/hr	1054	2.1	0.6
Density	kg/m3	57.8	650	983.2
Viscosity	CP	0.012	0.2	1
Particle Dia. Oil in Vapor	micron	200		
Oil in Water	micron	200		
Water in Oil	micron	200		

Light Droplet Terminal Velocity		
CRe ²	----	34
Drag Coefficient	----	21.23
Terminal Velocity	m/sec	0.004

Heavy Droplet Terminal Velocity		
CRe ²	----	566
Drag Coefficient	----	3.45
Terminal Velocity	m/sec	0.004

Trial Diameter	mm	1400
Inlet Nozzle Size	mm	150
Hv/D Ratio	----	0.357
Crest Safety Height	mm	100
Vapor Space	mm	500
Crest Height	mm	900
Wier Height	mm	800
Vessel Cross sectional Area	m2	1.54


Separation Compartment		
BTM - LLIL	mm	400
LLIL - LIL	mm	0
LIL - NIL	mm	150
NIL - HIL	mm	150
HIL - HHIL	mm	0
HHIL - WIER	mm	100
Total Liquid level Height	mm	800

Light Droplet Rising Time	min	2.2
heavy phase Cross Sec. Area	m2	0.6
Heavy Phase Velocity	m/sec	0.000
Lmin light drop through heavy ph	mm	39

Heavy Droplet Settling time	min	1.0
Light phase Cross Sec. Area	m2	0.3
Light Phase Velocity	m/sec	0.002
Lmin heavy drop through light ph	mm	100

Separation Comp. Length	mm	900
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BTM - LLIL Hold up Time	min	33.05
LLIL - LIL Hold up Time	min	0.00
LIL - NIL hold up Time	min	17.82
NIL - HIL hold up Time	min	5.36
HIL - HHIL hold up Time	min	0.00
HHIL - WIER hold up time	min	3.59
Heavy Phase hold up Time	min	17.82
Light Phase Hold up Time	min	5.36

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Bucket Compartment		
Bucket Wier Height	mm	800
BTM - LLLL	mm	150
LLLL - LLL	mm	100
LLL - NLL	mm	150
NLL - HLL	mm	150
HLL - HHLL	mm	200
HHLL - WIER	mm	50
Total Liquid level Height	mm	800

Bucket Comp. Length		
BTM - LLLL Hold up Time	min	1.73
LLLL - LLL Hold up Time	min	1.94
LLL - NLL hold up Time	min	3.52
NLL - HLL hold up Time	min	3.96
HLL - HHLL hold up Time	min	5.57
HHLL - WIER hold up time	min	1.39
Hold up Time	min	7.48

Heavy Phase Compartment		
Pipe Outlet Height (based on)	mm	715
BTM - LLLL	mm	150
LLLL - LLL	mm	100
LLL - NLL	mm	100
NLL - HLL	mm	165
HLL - HHLL	mm	150
HHLL - Pipe Outlet	mm	50
Total Liquid level Height	mm	715

Heavy Phase Comp. Length		
BTM - LLLL Hold up Time	min	2.68
LLLL - LLL Hold up Time	min	2.78
LLL - NLL hold up Time	min	3.27
NLL - HLL hold up Time	min	6.06
HLL - HHLL hold up Time	min	5.91
HHLL - WIER hold up time	min	2.00
Hold up Time	min	9.33

Vapor Side		
K vlaue	m/sec	0.056
Terminal Velocity	m/sec	0.18
Mesh Pad Correction Factor	----	1.00
Drop out Time	sec	2.77
Av Cross sectional Area	m2	0.50
Vapor Velocity	m/sec	0.59
Lmin light phase thr. vapor	mm	1632

Vessel Length	mm	3230
L/D	----	2.31

