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Separator Spec Sheet

Separator size is 1200 x 3600 mm, design pressure 80 bar @ 250 degree c, 33000 NM3/d, 3000 bbl/d. Separator fitted with:

- ESMER multiphase meter, Specifications:
- ESMER GL2
- System: 2" SCH80s 600# RF
- Body and flange material: SS316
- Impuls tubing and fittings: AISI 316L (1.4404)
- Skidframe: AISI 316L (1.4404)
- Cone beta ratio: 0,7
- Design pressure: 60 Barg
- Design temperature: 220 2 C
- Separator is fitted with auto sampler.
- Separator is fitted with GWF level transmitter.
- Separator is fitted with Vortex flow meter.
- Fitted with water cut meter.

		Two Pha	ase Se	parator								
Equipment No.: V-101			Number	required:					1			
		OPERAT	TING/MEC	HANICAL	DATA							
Description											Unit	S
Contents	(Crude Oil Feed										_
Working temperature, min./normal/max.		90 - 170						\perp	\perp		°C	_
Working pressure - min./normal/max.	-	11 - 22						Щ,			barg	_
- normal/min.vac. conditions					+		+				mbara	_
Design temperature, upper/lower	210	_	20		+		+				°C	_
Design pressure, internal/external	42		V		_		_				bar g	_
Test pressure, hydrostatic/pneumatic	55	hydro	otest				+				bar g	_
Liquid - quantity (Note	1)	50 - 310					+				m3/d	_
- density at 15°C	+	810 - 966					_				kg/m3	_
- density at working temperature Vapour - quantity (Note	2	1000 - 10000					-				kg/m3 Sm3/d	_
Vapour - quantity (Note - molecular weight	7)	21 - 29					_				Sm3/d	_
- density at working temperature	+-	8.9 - 17.85					_				kg/m3	_
Healing/cooling medium	+	NA									ng/illio	
- max. quantity required	+	NA					_				kg/s	_
man quality requires	+	747					+				ngro	_
Diameter of shell ID	+	850			$\overline{}$		+				mm	_
Length between tangent lines	+-	1200					_				mm	_
	+-	0079800					_				Units	_
	+-						$\overline{}$					
Type of heads (Note:	2)	Semi-elliptical					+					
Wall thickness - shell/head (Note 4 &		20									mm	
Corrosion allowance/lining/cladding		3					\top				mm	
Insulation Type / Thickness		PP / 50					\top				mm	_
Total volume (including vessel heads) :	0.84	m^3	Relief val	ve(s)	- Type/siz	te	:	Convention	onal		1D2	
Normal liquid volume :	0.30	m ³			- Set pres	ssure	:	42				
Volume range required for level control :	0.33	m ³			- Number	required	:	1				
Peak wind speed (3 sec gust) :	45											
		mis	Earthqua				:		Not A	Applicable	9	
		m/s	Earthqua		INFORI	OT NOITAN	EE SUBN	MITTED W			9	
		m/s	Earthqua		INFORI	MATION TO	EE SUBN	MITTED W			9	
		mis	Earthqua		INFORI	MATION TO	EE SUBN	MITTED W			9	
		mis	Earthqua		INFORI	MATION TO	BE SUBM	MITTED W				
		mis	Earthqua		INFORI	MATION TO	E SUBM	MITTED W			3	
		ms	Earthqua		INFOR	MATION TO	E SUBM	MITTED W			3	
		mls	Earthqua		INFOR	MATION TO	E SUBM	MITTED W			2	
				ke Zone		MATION TO	E SUBM	MITTEDW			9	
Note 4: No querranias la canalidade						MATION TO	E SUBM	MITTEDW			9	
	sally head to	REN	MARKS O	ke Zone		MATION TO	EE SUBM	MITTEDW				
Note 2: Given head type is indicative. The most economic		REN	MARKS O	ke Zone		MATION TO	BE SUBM	MITTEDW				
Note 2: Given head type is indicative. The most economic Note 3: No slug size is considered and no foaming is con	sidered.	REM	MARKS O	N REVISION		MATION TO	BE SUBM	MITTEDW				
Note 2: Given head type is indicative. The most economic Note 3: No slug size is considered and no foaming is con Note 4: Vessel weld joint efficiency considered as 1. Fo s	sour service v	REN pe to be selecte ressel fully radio	MARKS O	N REVISION		MATION TO	BE SUBM	MITTEDW				
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by: AB 02-06-2019 EQUIPM Chk'd Date by: WW 02-06-2019 CL	esidered. sour service v design code. MENT: IAME:	REM De to be selecte Vessel fully radio	MARKS Of	N REVISION dor.		MATION TO	Rev.	01	02 02-05-			
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				Proces Two Pha									
Eminorent No.	(404				Nombar					_			=
Equipment No.: V	/-101					required:				1			
				OPERA	TING/MEC	HANICAL DA	IA						_
	Description											Uni	5
Contents				Crude Oil Feed									
Working temperature,				90 - 170		lacksquare						°C	_
Working pressure -	min./normal/max.			11 - 22								barg	_
-	normal/min.vac. condi	itions										mbar a	_
Design temperature, ı	apper/lower		210	-4	20							°C	
Design pressure, inte	mal/external		42	F	·V							bar g	
Test pressure, hydros	tatic/pneumatic		55	hydr	rotest							bar g	
Liquid - quantity		(Note 1)		50 - 310								m3/d	
- density at	15°C											kg/m3	
- density at	working temperature			810 - 966								kg/m3	
Vapour - quantity		(Note 1)		1000 - 10000								Sm3/d	_
- molecular	weight			21 - 29				$\neg \vdash$					_
	working temperature	$\overline{}$		8.9 - 17.85		<u> </u>		$\neg \vdash$				kg/m3	_
Heating/cooling media		$\overline{}$		NA				\dashv				-	_
	ntity required			NA NA		 		\dashv				kg/s	_
max. quai	,	+						\dashv					_
Diameter of shell ID		+		850			1	\dashv		<u> </u>		mm	_
Length between tange	ent lines	+		1200			<u> </u>	\dashv				mm	_
Lengin between lange	ant lines			1200								mm	_
		\longrightarrow											_
													_
Type of heads		(Note 2)		Semi-elliptical			_						
Wall thickness - shell/		(Note 4 & 5)	20									mm	
Corrosion allowance/l	ining/cladding			3								mm	
Insulation Type / Thic	kness			PP / 50								mm	
Total volume (includir		:	0.84		Relief val	ve(s) - Ty	pe/size	:	Convent	onal		1D2	
Normal liquid volume	_	:	0.30	m ³		- Se	et pressure	:	42				
Volume range require	d for level control	:	0.33	m ³		- Ni	umber required	:	1				
Peak wind speed (3 s	ec gust)	:	45	m/s	Earthqua	ke Zone		:		Not	Applicable	:	
						IN	FORMATION T	O BE SUB	MITTED W	ITH THE 1	TENDER		
													_
													_
				DEM	IAPKe O	N BEMISIONS							
Note 1: No superior	a is considered			REM	IARKS OF	N REVISIONS							
Note 1: No overdesign			hi hoed t										
Note 2: Given head ty	pe is indicative. The m												
Note 2: Given head ty Note 3: No slug size i	rpe is indicative. The m s considered and no fo	oaming is consid	lered.	pe to be selecte	ed by Ven	dor.							
Note 2: Given head ty Note 3: No slug size is Note 4: Vessel weld jo	rpe is indicative. The m s considered and no fo pint efficiency consider	oaming is consid	lered. r service	pe to be selecte	ed by Ven	dor.							
Note 2: Given head ty Note 3: No slug size is Note 4: Vessel weld jo	pe is indicative. The many seconsidered and no for considered and no for considered considered thickness of the co	oaming is consid	lered. r service	pe to be selecte	ed by Ven	dor.							
Note 2: Given head ty Note 3: No slug size is Note 4: Vessel weld jo Note 5: Vendor to co Made	rpe is indicative. The mass considered and no for point efficiency considered and from the wall thicknown that the wall thicknown the wall the wall thicknown the wall thicknown the wall the wall thicknown the wall the wall thicknown the wall the wal	oaming is considered as 1. Fo sou	lered. r service ign code.	rpe to be selecte vessel fully radi	ed by Ven	dor.		Rev.	01	02			
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Note 2: Given head ty Note 3: No slug size is Note 4: Vessel weld jo Note 5: Vendor to co Made by: AB	rpe is indicative. The most considered and no for coint efficiency considered and most confirm the wall thickn Date 02-05-2019	oaming is considered as 1. Fo souness as per desi	r service ign code. NT:	rpe to be selected vessel fully radion.	ed by Ven	dor. s required.		Rev.					
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Note 2: Given head ty Note 3: No slug size is Note 4: Vessel weld jo Note 5: Vendor to co Made by: AB Chk'd by: VW	pe is indicative. The mass considered and no for coint efficiency considered profirm the wall thickn Date 02-05-2019 Date 02-05-2019	eaming is considered as 1. Fo sources as per designation EQUIPME NAI	r service ign code NT: ME:	vessel fully radio	ed by Ven	dor. s required.			22-04- 2019	02-05-			

		Process Dat Two Phase S							
			<u> </u>						
D-d	_	MATERIAL SP			40	TM N -			
Part		ASTM No.	Part		TM No.				
Shell	_	16 Gr. 60 equivalent	Downcomers	by vend	•				
Cladding/lining of shell		endor	Baffles			by vendor			
leads		16 Gr. 60 equivalent	Internal pipe fittings	-+	by vend				
caldding/lining of heads	+	endor	Stud bolts, external Nuts, external	-+	by vend				
Reinforcing rings					by vend				
kirt, base plate, etc.	_	endor	Bolts, internal	-+	by vend				
Baddles	_	endor	Nuts, internal	-+	by vend				
acket	+	endor	Gaskets, external	-+	by vend				
hell flanges	_	endor	Gaskets, internal	-+	by vend	or			
lozzles (line pipe/plate)	+	endor							
iner of nozzles and manholes	_	endor							
langes (ANS)	+	endor							
langes (Non-ANS)	_	endor							
Velding fittings		endor							
tiffening rings		endor							
nsulation support rings	by v	endor							
cleats for platforms. etc.	by v	endor							
nternal parts	883	16L							
		FABRICATION AND INSPE	CTION REQUIREMENTS						
construction in accordance with:									
nspection		By vendor							
spection authority		By vendor							
tress relieving		By vendor							
Special heart treatment		By vendor							
Radiography		Full							
Other non-destructive testing		By vendor							
Chemical analysis		By vendor By vendor							
Manufacturer's certificate - chemical an	alveie	By vendor							
- mechanical		By vendor							
	data	WEIG	HTS						
Erection weight (shipping weight)			Weight of internals :			By Vendor			
Total weight, operating			Weight of insulation :			NA NA			
Total weight, full of water		,	Weight of fireproofing :			101			
out Holgin, full of Hator	-	by volucion ing	Troight of inoprooning .						
		REFERENCE DE	RAWINGS/LIST						
Arrangement - construction - outline :									
Standard vessel :									
Additional drawings :									
Welding electrodes, rods, etc.:			refer international Std.						
General remarks for vessels :			Anchor bolt ring and base plate	e :					
Flanged pipe nozzles :			Lifting lug :						
Thermowell nozzles :			Name plate	:	By vendor				
Carbon steel flanges :			Support ring for insulation	:					
/ortex breaker :			Inspection hole/hand hole/						
Skirt/saddles/brackets :			manhole/davits, etc.	:					
Note: This sheet is to be confirmed and/or co	ompleted by	the Vendor.							
he manufacturer is responsible for ensuring that the equip			ns and codes referred to on the data sheet	/requisition and/o	or drawings. Furthermore, the	manufacturer is responsib			
nsuring that the design, including thicknesses of pressure	parts, is satisfact	ory for the design conditions indicated on the data s	heet / requisition and/or drawings. Calculat	ions and thickne	sses of material supplied to th	e manufacturer are for info			
nd tendering purposes only. The manufacturer shall make btain all necessary approvals from statutory authorities.	his own calculation	ons tor which he is fully responsible. The manufactu	rer shall ensure that the equipment supplie	d conforms to all	applicable codes and national	I statutory regulations, and			
ng. by :				Doc. No.					

Process Data Sheet Two Phase Separator

1			NOZZLE	DATA (Note 3)	
2 Ma	ark	Number	Service	Nom. dia. and flange rating	Remarks
3	N1	1	Feed Inlet	DN 80 (600#)	Horizontal half-open pipe
4	N2	1	Vapour outlet	DN 50 (600#)	On nozzle A1
5	N3	1	Liquid outlet	DN 80 (600#)	Provide vortex breaker
6	N4	1	Drain	DN 50 (600#)	Note 1
7	N5	1 Vent		DN 50 (600#)	Note 1
8	N6	1	Utility connection for flush	DN 50 (600#)	Note 1
9	N7	1	Utility connection for drain	DN 80 (600#)	Note 1
10	N8	1	PSV	DN 50 (600#)	Note 1
11	N9	1	Spare	DN 80 (600#)	Note 1
12					
13					
14					
15					
16					
17					
18			INSTRUMEN	IT CONNECTIONS	
19			INSTRUMEN	TI CONNECTIONS	
20	K1	1	Pressure Gauge	DN 50 (600#)	Note 1
21 K	(2A/B	2	Level gauge	DN 50 (600#)	Note 1
22	K3	1	Level Transmitter / Controller	DN 80 (600#)	Note 1 & 2
23	K4	1	Temperature Gauge	DN 50 (600#)	Note 1
24					
25					
26					
27					
28					
29					
30					
31					
32					
33		<u> </u>	MANHOLES ETC.		
34					
35	A1	1	Flange connection	DN 400	Note 1
36					
37					
38					
39					

42 Note 1: Nozzle size to be confirmed by Vendor.

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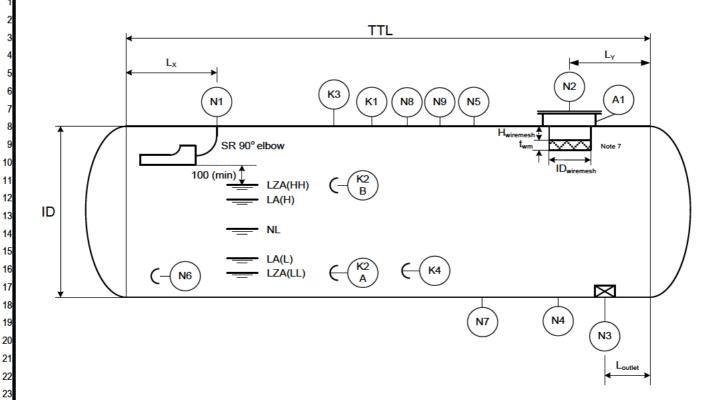
52 53 54

43 Note 2: Level transmitter is Guided Wave Radar type, hence vendor to provide stilling well.

44 Note 3: Vendor to consider insulation thickness for deriving the nozzle projection.

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Process Data Sheet Two Phase Separator



Main D	imensi	ions		Level settir	ng rela	tive to b	ottom of vessel	Wiremesh	dimen	sions	
TTL	=	1200	mm	LZA(HH)	=	550	mm	H_{wm}	=	100	mm
ID	=	850	mm	LA(H)	=	450	mm	t _{wm}	=	100	mm
t _{wm}	=	100	mm	LA(L)	=	180	mm	$ID_{wiremesh}$	=	350	mm
L _{outlet}	=	250	mm	LZA(LL)	=	50	mm				
L_{x}	=	410	mm (5)								
L_y	=	300	mm (6)								

General Remark

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36 37

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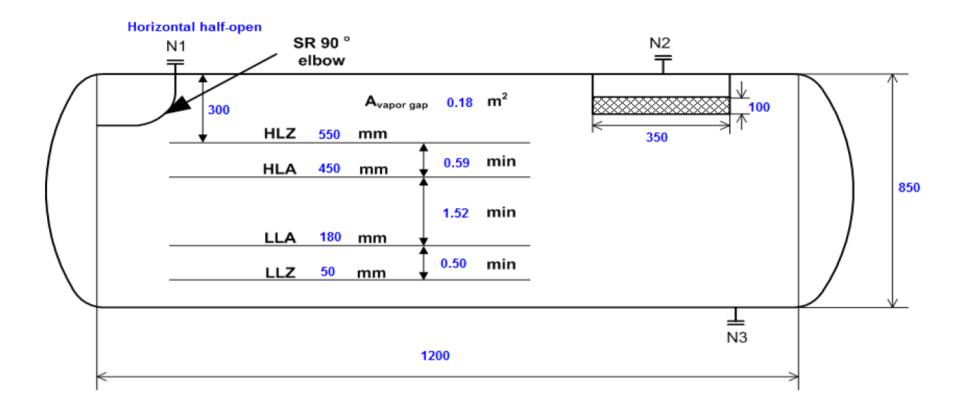
41

51 52

- (1) Vessel shall be designed in accordance to ASME section VIII Div. 1.
- (2) Product outlet nozzle N3 shall be equipped with a type A vortex breaker.
- (3) The LZA(HH) and LZA(LL) are level settings only for indicative purpose. The actual operating level will be from LA(H) & LA(L). NLL shall be 350 mm.
- (4) As feed inlet a horizontal half open pipe is installed. The distance between the bottom of the half open pipe and the LZA(HH) level shall be minimum 100 mm. The half open pipe oulet area shall be minimum four times the area of the feed inlet nozzle
- (5) Given distance is an estimation. The inlet device shall end at the vertical plane of the vessel T.L.
- (6) Given distance is an estimation. Distance shall be mechanical minimum from the vessel T.L.
- (7) Hand hole 16" is provided for installing and removing the wiremesh demister.
- (8) All internals shall be properly supported in the vessel.

Eng. by :

SUMMARY SHEET FOR TWO PHASE SEPARATOR



INPUT DATA							
Stream data							
Vapor overdesign factor	1.00	-					
Liquid viscosity	2.00	cР					
Liquid overdesign factor	1.00	-					
Vessel							
Slug size	0.00	m^3					
Foaming allowance	No						
Head type	Semi-elliptica	l					
G/L separation internal	Horizontal wiremesh						
Residence time HLA-HLZ	0.50	min					
Residence time LLA-HLA	1.50	min					
Residence time LLZ-LLA	0.50	min					

OUTPUT D		
Vessel		
Vessel ID	850	mm
Vessel TL-TL	1200	mm
DESIGN CH		
Vessel		
Gas load factor	0.105	m/s
Axial gas velocity	0.091	m/s
Axial liquid velocity	0.0123	m/s
Liquid le		
HLZ level	550	mm
HLA level	450	mm
LLA level	180	mm
LLZ level	50	mm
Separation eff	ficiency	
Inlet device G/L efficiency	80	%
Demister thickness	100	mm
Demister area	0.10	m^2
Demister ID	350	mm
Demister gas load factor	0.011	m/s
Cut off vapor droplet (note 1)	212	micron
D _{min} Liquid Degassing	320	mm
D _{min} Defoaming	650	mm
Pressure o	Irop	
Vapor pressure drop	1825	Pa
(including in- and outlet nozzles)		
Nozzles N1 Feed nozzle		
	3"	
N2 Vapor outlet nozzle	2" 3"	
N3 Liquid outlet nozzle	3"	

Note 1: Degassing of the vapor in the liquid phase is based on an assumed normal liquid level in the vessel of 320 mm

Note 2: HLZ & LLZ level are only for indicative purpose.