



**MANGALORE REFINERY & PETROCHEMICALS LTD.**  
(A subsidiary of Oil & Natural Gas Corpn. Ltd – ONGC)  
Read. Office: Kuthethoor P.O.. Via: Katiballa. Mangalore-575030



**Addendum - 5**

**To**

**MRPL Tender No. 9680000M1B dated 11.03.2022**

**DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF LPG AMINE CONTACTOR FOR  
LPG AMINE ABSORBER SYSTEM IN PFCC UNIT AT MRPL, MANGALURU, KARNATAKA**

With reference to the above tender, bidders are requested to note the following:

The items, conditions, specification and stipulations of the Bidding Documents stand modified to the extent indicated in Annexure -1 - Technical Addendum.

The implications of the same, elsewhere in the tender document shall be taken care of appropriately by the bidders. All other terms and conditions, stipulations and specifications of tender shall remain unaltered.

**Bidders shall submit copy of this Addendum-5 including its Annexure-1 with the techno-commercial bid, duly signed and stamped, as a token of having read and understood the same.**

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### Annexure-1: Technical Addendum

Sl. No.	Section No. / Clause No.	The Clause/Description stands Modified as below
1.	Techno Commercial Addendum	<ul style="list-style-type: none"><li data-bbox="820 501 1283 524">• BIDDER TO REFER ATTACHED DOCUMENT</li></ul>
2.	Process Datasheet -9680-01-DS-DA-33211 Rev 3 of LPG AMINE CONTACTOR	<ul style="list-style-type: none"><li data-bbox="820 631 1465 689">• BIDDER TO READ ATTACHED PROCESS DATASHEET 9680-01-DS-DA-33211 Rev 4 of LPG AMINE CONTACTOR</li></ul>

The tender document clauses mentioned below are amended to the following extent

SI No	Clause No:	Page No	Clause	Amendment
1	SECTION- 6, PRICE SCHEDULE, FORM SP – 0, Transportation Clause No: 5.1	PDF page No: 191 of 491	The equipment has to be transported in single piece up to the MRPL Site	Refer note below
2	JOB SPECIFICATION FOR LPG AMINE CONTACTOR, Doc No: 9680-02-JS-201, Clause No: 3.2 and Bullet Point No:8	PDF page No: 204 of 491	Packing & Transportation (in single piece)	Refer note below
3	JOB SPECIFICATION FOR LPG AMINE CONTACTOR, Doc No: 9680-02-JS-201, SCOPE OF SUPPLY AND WORK, Clause No: 7.0 and Sub Clause No: 7.2, Point No: xlvii.	PDF page No: 208 of 491	Supply of equipment along with other materials to purchaser designated place. Transportation of the column shall be supplied in the single piece up to the site designated place.	Refer note below
4	JOB SPECIFICATION FOR LPG AMINE CONTACTOR, Doc No: 9680-02-JS-201, SCOPE OF SUPPLY AND WORK, Clause No: 7.0 and Sub Clause No: 7.2, Point No: xlvii.	PDF page No: 213 of 491	All items and materials supplied shall be wrapped and suitably protected to prevent any damage during transportation. Bidder shall ensure rust preventive work as applicable. Equipments which are transported by sea shall have sea-worthy packing. Packing should be suitable for the specified duration in the existing climatic conditions at the site. Packing list shall be attached at the outside of the crate as per standard practice and one packing list shall be placed inside the box. Column shall be transported in single piece.	Refer note below

Note:

Columns can be transported in single piece or the following methodology shall be adopted if required to facilitate transport of the ODC consignment:

- The column shall be fabricated in full length along with the skirt and fully hydro tested at shop floor.
- To facilitate transport, if required, the Skirt shall be cut after completion of the entire column fabrication and NDT.
- The Column skirt if required shall be cut by leaving at least 500mm length from the fillet weld joint of Column with skirt or as approved with exact dimensions by the consultant/ MRPL during the detailing.
- Sufficient tolerances in the Skirt length t shall be considered for cutting and edge preparation at site.
- At site, edge preparation, fit up and welding shall be carried out by the qualified shop floor welders only under the supervision of Consultant
- The joint after completion shall be subjected to all applicable NDT as recommended by Consultant. NDT shall include but not be limited to edge DPT of joint after edge preparation prior to welding, Preheating if necessary, Post heating, Post weld heat treatment and 100% Radiography. Radiography shall be carried out twice (before and after Post weld heat treatment) . This shall be followed by final weld visual inspection





## MANGALORE REFINERY AND PETROCHEMICALS LIMITED

EPCM SERVICES FOR INSTALLATION OF  
LPG AMINE ABSORBER SYSTEM IN PFCC UNIT  
AT MRPL, MANGALURU



# PROCESS DATA SHEET - LPG AMINE CONTACTOR

4	6/5/2022	RE-ISSUED FOR ENGINEERING	LKJ	CHS	VPB
3	15/12/2021	RE-ISSUED FOR ENGINEERING	AMW	VPB	VPB
2	11/8/2021	ISSUED FOR DETAILED ENGINEERING	RBN	VPB	VPB
1	1/7/2021	RE-ISSUED FOR FEED	GMN	RBN	VPB
0	10/6/2021	ISSUED FOR FEED	RBN	SNI	VPB
Rev.	Date	Description	Prpd.	Chkd.	Appd.
<p>Triune Energy Services Pvt. Ltd. New Delhi</p>		<p>PROCESS DATA SHEET - LPG AMINE CONTACTOR</p>	Document Number		Rev.
			9680-01-DS-DA-33211		4
Sheet 1 of 5					

 	PROJECT	MRPL LPG Amine Treatment Unit Process Design Package (PDP)		
	CLIENT	Mangalore Refinery & Petrochemicals Limited (MRPL)		
PROCESS DATASHEET FOR LPG AMINE CONTACTOR	Project No. 075588C001	Document No. 075588C-332-PDS-0510-001	Rev.No. 0	Page 2 of 5

**PROCESS DATASHEET**  
**FOR**  
**LPG AMINE CONTACTOR (DA-33211)**

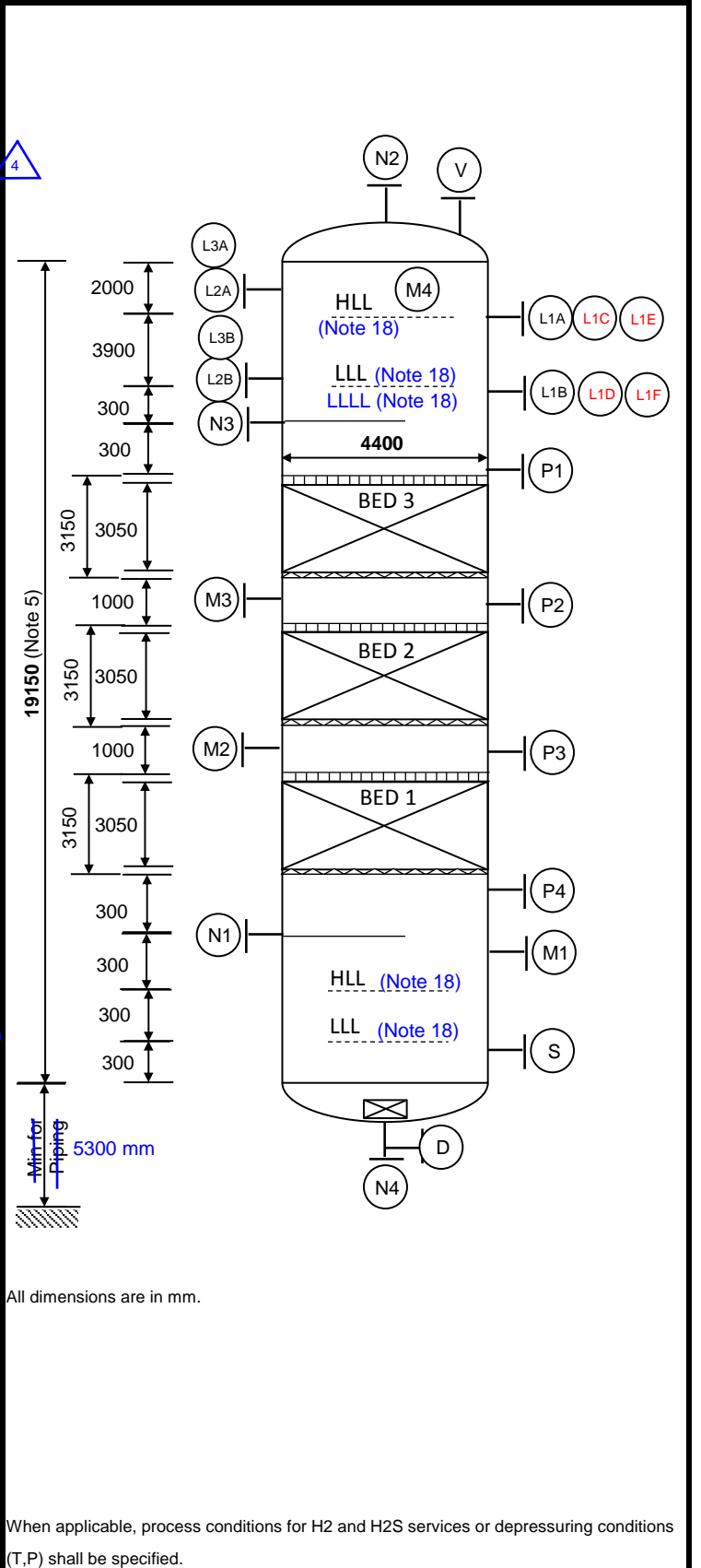
REV	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED	AUTHORIZED
0	19.07.2019	FINAL ISSUE	S SUNDARI	S C BHARATH	PAUL MARCHANT	DAVID VAN WYK
A	13.06.2019	ISSUED FOR REVIEW	S SUNDARI	S C BHARATH	PAUL MARCHANT	DAVID VAN WYK

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Revision	CLIENT	MRPL	LPG AMINE CONTACTOR	Rev.	Date	Made by	Checked by	Page
	LOCATION	Mangalore, India		A	13.06.2019	SS	SCB	3 of 5
	UNIT	332		0	19.07.2019	SS	SCB	

1	ITEM	DA-33211		
2	SERVICE	LPG AMINE CONTACTOR		
3		OPERATING	PROCESS DESIGN	
4	Pressure	kg/cm <sup>2</sup> g	kg/cm <sup>2</sup> g	
5	0 Top	27.0	36.4 / FV (Note 4)	
6	0 Bottom	29.0	36.4 / FV (Note 4)	
7	Temp.	°C	°C	
8	Top	44	65	
9	Bottom	44	65	
11		SHELL /	WELDED	
12		ENDS	INTERNAL PIECES	
13	Materials	KCS	SS316L	
14	Corrosion allow.	3mm SS316 Clad		
15	Fluid :	LPG / Amine		
16	0 Density at T :	LPG =527.9 & Amine = 1026.2	kg/m <sup>3</sup>	
17	Insulation	None		
18	Lining	-		
19	Elev. betw. lower TL & reboil. lower part =	NA	min.	
20	Lower TL elevation above ground =	5.3 m	Min for piping 3 min.	
25	NOZZLE DATA			
26	REF.	Nb	Ø	SERVICE
27	M	4	24	Manhole + B.F. + Devit
29	N1	1	16	LPG Inlet (With Inlet Pipe and Distributor) (Note 17)
30	N2	1	16	LPG Outlet
31	N3	1	3	Lean Amine Inlet (With Inlet Distributor) (Note 17)
32	0 N4	1	4	Rich Amine Outlet (With Vortex Breaker)
33	0			
35	D	1	4	Drain
36	V	1	4	Vent
37	S	1	3	Steam out
39	P1 - P4	4	3	Differential Pressure Transmitter
40	0			
41	0			
43	L1A -F	6	3	Level transmitter (Interface)
44	L2A/B	2	3	Level transmitter (Interface)
45	L3A/B	2	3	Level Gauge



All dimensions are in mm.

When applicable, process conditions for H2 and H2S services or depressuring conditions (T,P) shall be specified.



PROCESS DATA SHEET

Project N° - Unit	Doc. type	Equipment N°	Serial N°	Rev. index
<b>075588C-332</b>	<b>PDS</b>	<b>0510</b>	<b>001</b>	<b>0</b>

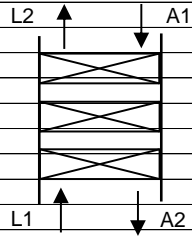
<b>CLIENT</b> MRPL	<b>LPG AMINE CONTACTOR (INTERNALS)</b>	Rev.	Date	Made by	Checked by	Page	Revision
<b>LOCATION</b> Mangalore, India		A	13.06.2019	SS	SCB	4 of 5	
<b>UNIT</b> 332		0	19.07.2019	SS	SCB		

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4 **SERVICE**

COLUMN ITEM	DA-33211
COLUMN SERVICE	LPG AMINE CONTACTOR
PACKING SERVICE	LPG AMINE CONTACT (Bed 1 to 3) (Note 11)
PACKING TYPE	RANDOM (IMTP #50 or I-RING) (Note 14)
INSIDE COLUMN DIAMETER (A)	4400 mm

15 **OPERATING CONDITIONS**



EXCHANGED HEAT : 0 Gcal/h

	CASE 2				
	L1	L2	A1	A2	
PRODUCT	SOUR LPG	TREATED LPG	LEAN AMINE	RICH AMINE	
TEMPERATURE (T) °C	44	43.8	45	43.6	0
PRESSURE kg/cm <sup>2</sup> g	29	27	27	29	
DENSITY AT T kg/m <sup>3</sup>	527.9	528.1	1026.2	1026.4	0
VISCOSITY (B) cP	0.107	0.107	2.34	2.387	0
SURFACE TENSION dynes/cm	4.686	4.685	59.496	59.53	0
FLOW RATE AT CONDITIONS (Note 12) kg/h	170520	170591	15479.3	15407.8	0
m <sup>3</sup> /h	323.0	323.0	15.1	15.0	0

30 **CHECK CASE 1**

	CHECK CASE 1				
	L1	L2	A1	A2	
PRODUCT	SOUR LPG	TREATED LPG	LEAN AMINE	RICH AMINE	
TEMPERATURE (T) °C	44	43.6	45	43.6	0
PRESSURE kg/cm <sup>2</sup> g	29	27	27	29	
DENSITY AT T kg/m <sup>3</sup>	527.9	528.4	1026.2	1025.9	0
VISCOSITY (B) cP	0.107	0.108	2.34	2.421	0
SURFACE TENSION dynes/cm	4.686	4.703	59.496	59.396	0
FLOW RATE AT CONDITIONS (Note 12) kg/h	170520	170658.3	2783.4	2645	0
m <sup>3</sup> /h	323.0	323.0	2.7	2.6	0

42 ALLOWABLE PRESSURE DROP kg/cm<sup>2</sup> (Note 13)

44 **MATERIALS** SS316L (Note 11)

46 **REQUIREMENTS**

- 48 THE MANUFACTURER WILL SPECIFY THE PACKING HEIGHT REQUIRED : 3050 (Note 11) mm
- 49 THE SUPPLY INCLUDES THE LIQUID DISTRIBUTOR AND THE PACKING SUPPORT.
- 52 THE PACKING AND DISTRIBUTOR WILL HAVE TO WORK SATISFACTORILY FOR FLOW RATES OF 60 - 110 % OF SPECIFIED FLOW RATES.
- 55 THE MANUFACTURER WILL GUARANTEE THE PRESSURE DROP AND FLEXIBILITY OF THE PACKING ZONE, INCLUDING THE PACKING ITSELF, THE PACKING SUPPORT AND THE DISTRIBUTOR.
- 58 THE MANUFACTURER WILL INDICATE IF A FILTRATION SET IS REQUIRED AND WILL SPECIFY FILTER MESH IF ANY.

60 **GENERAL NOTES**

- 61 (A) UNLESS OTHERWISE SPECIFIED.
- 62 (B) LIQUID PHASE ONLY.

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PROCESS DATA SHEET

Project N° - Unit	Doc. type	Equipment N°	Serial N°	Rev. index
075588C-332	PDS	0510	001	0

CLIENT MRPL	LPG AMINE CONTACTOR	Rev.	Date	Made by	Checked by	Page	Revision
LOCATIOI Mangalore, India		A	13.06.2019	SS	SCB	5 of 5	
UNIT 332		0	19.07.2019	SS	SCB		

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3	<b>NOTES:</b>
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5	1. Column is designed for following cases:
6	Maximum Loads      Case 2 with 10% overdesign
7	Minimum Loads      Check Case 1 with 60% turndown
8	2. Column is subjected to steam out. Steam out conditions are 0.5 kg/cm <sup>2</sup> g @ 200 °C
9	3. Minimum Design Metal Temperature (MDMT): 16° C .
10	4. Deleted. <span style="float: right;">△ 4</span>
11	5. Column height to be confirmed based on vendor data.
12	6. Column is in Amine service.
13	7. Column is in sour service. NACE applicable. Max H2S content in LPG feed = 0.02 wt%
14	Max H2S content in Lean Amine feed = 0.172 wt%
15	8. Bed Numbering is from Bottom to Top.
16	9. All internals shall be removable through manways.
17	10. Approved internals/packing vendors are Koch-Glitsch & Sulzer Chemtech
18	11. Diameter, packing height, number of beds, distributor, and material dimensions to be checked and confirmed by
19	packing manufacturer <del>and Detailed Engineering Contractor.</del>
20	12. Loads indicated are Normal flowrate.
21	13. <span style="border: 1px solid blue; padding: 2px;">Total</span> allowable pressure drop 0.35 kg/cm <sup>2</sup> to be considered across the beds of packing.
22	14. Vendor to confirm type of packing.
23	15. <del>Nozzle sizes are preliminary. All nozzles flange rating shall be minimum 300#</del> <span style="float: right;">△ 4</span>
24	16. <del>Plant designed considering 4 years continuous cycle time.</del>
25	17. As per "Requirement" mentioned on sheet 4 of 5 (to be decided by column internal manufacturer)
26	18. Column Top section level setting (from BTL):
27	HLL : 17150 mm
28	LLL : 13250 mm
29	LLLL : 13100 mm <span style="float: right;">△ 4</span>
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