



नेशनल फर्टिलाइजर्स लिमिटेड  
एन.एफ.एल.  
NATIONAL FERTILIZERS LIMITED

**ELIGIBILITY CRITERIA FOR SUPPLY, ERECTION & COMMISSIONING OF COMPLETE GAS CHROMATOGRAPH SYSTEM ALONG WITH ALL HARDWARE, SOFTWARE & SAMPLING SYSTEM AT AMMONIA-II PLANT, NFL VIJAIPUR**

SN	Conditions	Documents Required	Vendor's Compliance
1	<p>The bidders on its own or through its Original Equipment Manufacturer (OEM) should have experience of similar works at any Fertilizer/Petro-chemical/Oil &amp; Gas Industries/Refineries / Steel / Power Plants/ Cement Industries in India during last 7-years ending last day of the month previous to which NIT has been issued.</p> <p>Similar work means supply of "Gas Chromatograph system" along with installation/commissioning.</p>	<p>1) OEM authorization Certificate specific to this tender (If bid is submitted by Dealer/Channel Partner).</p> <p>2) In case of OEM, self-certification on the letter head.</p> <p>3) Copies of Purchase order for similar items with full technical scope of work &amp; commercial details including work order value during the last seven years ending last day of the month previous to which NIT has been issued :</p> <p>Three PO's of similar work each having values not less than value Rs. 17.40 lakhs (excluded taxes).</p> <p align="center"><b>Or</b></p> <p>Two PO's of similar work each having values not less than value Rs. 21.75 lakhs (excluded taxes).</p> <p align="center"><b>Or</b></p> <p>One PO of similar work each having values not less than value Rs. 34.80 lakhs (excluded taxes).</p>	
2	Performance/Completion certificate.	<p>i) The bidders on its own or through its Original Equipment Manufacturer (OEM) should submit performance/ completion certificate issued against above PO copies indicating PO Value, executed value and date of completion. Performance certificate should be issued by organization/firm where such "Gas Chromatograph system" are installed.</p>	
3	Bidder/Vendor shall submit a certificate from OEM confirming technical support and supply of spares for offered system model for a period of minimum 10-years.	Undertaking from OEM on their letter head for spares & service support of quoted system for a period of at least 10 years from the date of supply.	
4	<p>(i) The Average Annual financial turnover of the vendor during the last three years should be at least Rs. 13.05 Lakhs per annum for which bidder shall submit the certified copies of Audited Balance sheet/P&amp;L for the last three financial years ending on 31.03.2022.</p> <p>(ii) Net worth of vendor should be positive as on 31.03.2022.</p>	Vendor shall submit financial standing through Audited Balance sheet and Profit & Loss account for the last three years (for the year 2019-20, 2020-21 & 2021-22). In case the bidders do not fall under the ambit of statutory audit, and do not have audited annual reports/audited Balance sheet and Profit & Loss statements, shall submit a statement certified by Statutory Auditor/practicing chartered accountant as documentary evidence in support thereof.	

**Note:**

(i) In case performance/completion certificate from concerned organization/end user is not available, bidder can submit self-certification for the same on their letter head mentioning name & address of the organization, completion date, contact person name & contact details including email etc. NFL's decision of acceptance of Bid shall be final and binding to the vendor.

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Annexure - I

Technical Specifications For Gas Chromatograph

S.NO	System	Sub S.No	Description	Requirements	Vendors reply : Complied / not complied
1	General	i	Make & Model No.	Party to specify	
		ii	Area Classification	IEC Zone 2 Gr. IIC/IIb+H2, T3/T4	
		iii	Measurement Type	Continuous Online	
		iv	Scope of Supply	Complete Gas chromatograph system including sample pre-conditioning / sample handling system, Electrical heat tracing of sample lines (if required), sample bypass/ fast / return loop, calibration gas cylinders, carrier gas cylinders, analyser, signal conditioning unit, power supply unit, control unit / programmer unit and other necessary systems and accessories to complete the system.	
2	Analyser/ Probe	i	Location	To be mounted in analyser cabinet	
		ii	Power Supply	110 V AC $\pm 10\%$ , 50 Hz $\pm 3\%$ AC UPS	
		iii	Column	Micro packed column with high resolution and low carrier gas consumption	
		iv	Column size	Party to specify	
		v	Column Overheat Protection	Required	
		vi	Detector	Preferably Thermal Conductivity type	
		vii	Repeatability	$\pm 1\%$ of Full Scale	
		viii	Cycle Time	Party to specify.	
		ix	Sample Flow rate	Party to specify.	
		x	Sample Flow meter	SS316 or better material Rotameter suitable for the design Pressure & Temp. along with low sampling flow switch.	
		xi	Analyser Type	Microprocessor based, protected from industrial EMI/RFI interference	
		xii	Inputs/ Outputs	Isolated 4 to 20 mA DC outputs for measured components and also 1 No. RS 485 Serial Link with MODBUS Protocol.	
		xiii	Carrier Gas	Required for each component. (Hydrogen-99.999% Purity of H2) for minimum operation of 12 months	
		xiv	Calibration Gas	Required for each component. minimum operation of 12 months	
		xv	Protection	Analyser located in cabinet shall be explosion proof & area classification IEC Zone 2 Gr. IIC/IIb+H2, T3/T4.	

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S.NO	System	Sub S.No	Description	Requirements	Vendors reply : Complied / not complied
3	Sampling System	i	Items Required	The sampling system shall include all the necessary equipments and components for sample probe, line isolation valve, sample pre-conditioning/ pressure/ temperature regulation, sample transfer line, fast loop (if required), sample conditioning system, sample bypass & return lines, calibration port, vent/ drain header/port, Electrical heat tracing with temperature control for the sample lines (if required) etc.	
		ii	Location of Sample handling System	Primary sampling system: Near sample take off point, Secondary sampling handling system: outside the shelter (Party to specify if any), Analyser - Inside the cabinet/shelter	
		iii	Sample Tap off point Connection size / Rating / Flange material	1.5" Flanged ANSI 300#, RF, Suitable with process condition. Further connection with matching flange with sample probe etc. shall be under vendor/supplier scope as per requirement.	
		iv	Probe	Manufacturer's standard. Retractable type. Probe material - SS316 or better material suitable for process. probe rating shall be as per process conditions mentioned at point no-10.	
		v	Type of protection	All the electrical components located in field shall be explosion proof to IEC Zone 2 Gr. IIC/IIIB+H2, T3/T4 and weather proof to IP65.	
		vi	Interconnection tubing & fittings between sample take off points, sample conditioner and the sample handling/ conditioning system	Required, to be supplied by vendor	
		vii	Interconnection tubing & fittings between sample handling / conditioning system and Gas chromatograph & sample handling / conditioning system and sample return line	Required, to be supplied by vendor.	
		viii	Sample Module	Fast loop to achieve specified cycle times. Vendor's scope shall also include supply of all the suitable components, interconnecting tubings/ piping, tube fittings requirement to meet / pipe fittings including connectors. The sample return and fast loop shall be combined together by vendor. The tubing from Gas Chromatograph to final connection to process line shall be in vendor's scope.	
		ix	Size of Sample tubing	Sample tube in mm (OD) size (Vendor to furnish calculation for sample transport time. Tubing shall be selected to minimise transportation time and also to prevent clogging). Party to specify.	

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S.NO	System	Sub S.No	Description	Requirements	Vendors reply : Complied / not complied		
3	Sampling System	x	Material of tubing & all wetted parts of Sampling System	SS 316 or better			
		xi	Tube fittings	Tube fittings shall be double compression type and material shall be SS316 or better.			
		xii	Tubing length to be considered from Process tap to Analyser for each sample	80 meters (approx).			
		xiii	Air conditioning/Lighting/Tracing Power	Party to specify			
		xiv	Electrical Tracing of Sample and return lines	As per manufacturer recommendation. Vendor to clearly specify the same in offer if electrical tracing of sample and return lines is required.			
		i	Type	Microprocessor based			
		ii	Location	Inside Cabinet			
		iii	Mounting	Party to specify			
		iv	Memory Type	Non Volatile type or RAM with battery back up.			
		v	Self Diagnostics Facility	Required.			
		vi	Configuration Changes	It shall be possible to make configuration changes by an inbuilt keypad with keylock facility and by Computer (Licensed Software to be provided) placed in main control room.			
		4	Programmer / Controller	vii	Output of Controller	Isolated 4 to 20 mA DC output for each measured component and also RS 485 Serial Link with MODBUS Protocol. All required analysed concentration and alarms shall be made available on the serial link for connection to Centralized distributed control system (DCS) located in main control room and in supplied Desktop computer System as per point no 27.2.	
				viii	Local Display Unit	Preferably LED/LCD digital display.	
				ix	Protection type	Analyser located in Panel/cabinet shall be explosion proof to the area classification IEC Zone 2 Gr. IIC/IIB+H2, T3/T4.	
x	Power Supply			110VAC ±10% UPS, 50Hz.			
i	Process Conditions						
ii	Fluid State						
iii	Operating Pressure   Design Pressure						
iv	Operating Temperature   Design Temp.						
v	Measured property						
vi	Alarms Required						
5	Service Conditions	vii	Gas Composition	As Mentioned below at point no 10.			

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S.NO	System	Sub S.No	Description	Requirements	Vendors reply : Complied / not complied										
<b>Notes:-</b>															
6	Complete Supply of software & hardware, design, engineering, erection, commissioning and training are in the bidders scope of supply.														
7	Bidder to note that all utilities like power, instrument air, steam etc. shall be provided by owner at one point near the analyser cabinet. Further distribution with all accessories regulators, adopter etc shall be in bidders scope of supply.														
8	Bidder to note that the distances from the sample take-off point upto the analyser and sample return line are tentative and shall be finalised during detail engineering.														
9	When the process pressure is higher than the design pressure of any downstream component of the analyser system, then bidder shall consider a pressure reducing valve in the primary sample handling system. Bidder to clearly indicate the same in the offer where pressure reducing valve is being offered in primary sample handling system. Bidder shall consider this distance as same as distance indicated for sample take-off point to the analyser .														
Components or physical property to be analysed as mentioned below:															
10	Tag Name	32-AT-101	32-AT-102	32-AT-103	32-AT-104	33-AT-105	33-AT-106	33-AT-108	33-AT-109	33-AT-110	35-AT-108	35-AT-109	35-AT-110	35-AT-111	37-AT-101
	Description	Primary reformer O/L CH4	SEC. REFORMER O/L CH4	HT CONVT O/L CO SLIP	LT CONVT O/L CO SLIP	Absorber O/L CO2	Absorber Mid CO2	METHANATOR O/L CO2	METHANATOR O/L CH4	B-3311 O/L H2	SYN covertor I/L H2	SYN covertor I/L N2	SYN covertor I/L CH4	SYN covertor I/L NH3	PGR O/L H2
	Pressure	35	35	31	29	25.6	30	25	25	25	180	180	180	180	30
	Temp.	780	970	420	215	65	70	20-45	20-45	20-45	220	220	220	220	40
	Composition														
	H2	67.81	56.01	59.88	60.9	74.48	67.79	74.16	74.16	74.16	62.38	62.38	62.38	62.38	91.47
	N2	0.45	22.46	20.48	19.96	24.43	22.195	24.74	24.74	24.74	20.79	20.79	20.79	20.79	4.65
	Ar	0.01	0.27	0.25	0.24	0.29	0.29	0.3	0.3	0.3	3.45	3.45	3.45	3.45	1.82
	CH4	11.48	0.38	0.35	0.34	0.42	0.56	0.8	0.8	0.8	8.44	8.44	8.44	8.44	1.96
	CO	8.98	12.75	2.82	0.21	0.26	3.5	*****	*****	*****	*****	*****	*****	*****	*****
CO2	11.27	8.13	16.22	18.35	0.12	3.5	*****	*****	*****	*****	*****	*****	*****	*****	
NH3														10ppm	
11	Use of any necessary arrangement to remove moisture, like dryer, as required, may be considered for measurement of components in upset conditions.														
12	Auto Cut off facility for isolation of the sample from main process line shall be provided as optional in sample line (i.e. during start up and shutdown of the plant). All necessary arrangement/supply pertaining to above shall be in bidder's scope of supply. Vendor to furnish the schematic diagram indicating the components required to achieve the above.														
13	Gas chromatograph should Auto shut down in case of leak or drop in carrier gas pressure.														
14	Gas chromatograph operating software should be of latest version .														

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S.NO	System	Sub S.No	Description	Requirements	Vendors reply : Complied / not complied
15			All the equipment and accessories required to make the system complete, shall be quoted by the vendor even if not specified in this specification.		
16			The bidder shall quote all the mandatory spares for 2 year operational maintenance of GC @ 20% of each spare item, along with bid/quotation. If bidder fails to offer the same minimum @ 20% of each spare, then vendor has to supply the same free of cost even if noticed at later stage.		
17			Bidder to submit authorisation certificate from OEM and also submit the reference list of offered make & model ( Either Through OEM or self) of Gas chromatography where they had supplied/installed in India & are working satisfactorily.		
18			The bidder to submit maintenance manual, operation manual, calibration manual and other applicable documents etc. (Three set of hard copy with soft copy) along with the supply of material. Bidder to submit licensed copy of software if any.		
19			Fully automatic microprocessor controlled GC with self-test during start up and should have extensive self diagnosis facility.		
20			Any material required for the completeness of the system shall be the responsibility of the vendor & vendor to consider all the required items in their quotation/bid.		
21			The bidder must indicate clearly the deviations / exceptions from the specifications.		
22			The bidder shall submit all relevant technical catalogues & manuals with specifications of the offered make & model alongwith bid for evaluation purpose.		
23			The bidder shall certify & confirm that offered Gas Chromatograph is of latest model & version. Vendor shall also confirm provision of spares & unconditional technical support for a period of min. 10 years.		
24			The vendor shall provide necessary certificates relating to the Guarantee, Test, calibration, Carrier gas cylinders & other applicable test certificates along with the supply of material. The offered model shall be guaranteed for 12 months from date of commissioning & final acceptance of the system. During Guarantee period if any problem occurs in gas chromatograph than party has to attend the same within a week without any financial implication.		
25			Annual maintenance contract(AMC) is required for 3 years after completion of guarantee time period. The AMC will include minimum four visits in a year. Accordingly bidder to quote the cost of AMC along with the bid submission. During AMC, supply of sample filters shall be under bidders scope and other maintenance spares will be provided by NFL.		
26			Detailed price breakup of all the offered items shall be clearly mentioned wherever required.		
27			<b>Bill of Material</b>		
27.1			Complete Gas chromatography along with all hardware & software, sampling systems and Cabinet as mention in above technical specification.	Unit Lot	Quantity 1
27.2			Computer system with following specification :- Processor- Intel i7 or latest, Hard drive : 500 GB SSD or better, RAM : 16GB or better, Power supply - 110VAC, Operating system - Windows 10 and other hardware & software required to communicate with Gas chromatograph. Computer system to be installed in Main Control room 300 mtrs away from Gas chromatograph cabinet. computer system communication with Gas chromatography is in bidders scope with required hardware and software for online monitoring of all the gas chromatography measured data.	No	1

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S.NO	System	Sub S.No	Description	Requirements	Vendors reply : Complied / not complied
27.3			Mandatory Spares includes following items if used in GC:- Solenoid valves , Flow meter with needle valve , Steel guard filters , Diaphragm filters , Paper filter ( Minimum 30 nos.), Moisture separator , Check valve , Pressure reducing valves , Stream selector , All types of Column (Minimum 1 no each), Power supply unit, CPU , Detector etc. @ 20% of each item or minimum one number.	Lot 1	
27.4			Other Mandatory spares , if not mentioned above at 27.3, then vendor to include the same in quotation @ 20% of each item or minimum one number, otherwise vendor has to supply the same free of cost to NFL if noticed at later stage.	Lot 1	
27.5			Supply of Calibration gas cylinders with regulator and Carrier gas cylinders (47L /150kg/cm2) with header, regulator & accessories for minimum operation of 12 months shall be under bidders scope of supply.	Lot 1	
27.6			Installation and commissioning charges	Lot 1	
27.7			AMC for three years after completion of gurantee time period. (1 engineer, 4 Visit per year)	Lot 1	
27.8			Technical manuals and calibration certificates (Hard copy & soft copy)	Set 3	
27.9			Any other materials required for the completeness of the system to be included by bidder	Set 1	
27.9			Maintenance & software engineering Training to 3 Engineers for 5 days in one batch after commissioning of supplied system at vendors works. To & fro travelling, lodging , boarding and local conveyance charges of all three trainees shall be under NFL Scope.	Lot 1	
27.10			Other hardware & software( Licensed Copy ) required for complete the system (Party to specify)	Lot 1	
28	<b>SPECIAL TERMS &amp; CONDITIONS FOR COMMISSIONING</b>				
28.1	Site Mobilization:				
a	The security of the vendors' equipment's and material is their own responsibility. NFL shall accept no liability for loss or damage to vendor' materials.				
b	The vendor will be responsible for providing all material, tools & tackles and consumables, etc. required for execution of work as per the best Engineering practices.				
c	Messing & Accommodation: The vendor will make his own arrangement for messing and accommodation of vendor personnel. However, accommodation may be provided by owner on chargeable basis subject to availability.				
d	First Aid: The contractor may have access to the owner's first aid post if available in case of accident.				
e	Erection and commissioning teams including site engineers shall be deputed by the vendor for erection and commissioning of supplied control system.				
f	Entire work is to be completed as per the time schedule already submitted and approved by the owner. The vendor shall conform to the targets set forth in the time schedule.				
28.2	Subletting of scope of work : No subletting of work is not allowed .				

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S.NO	System	Sub S.No	Description	Requirements	Vendors reply : Complied / not complied
28.3	<b>Employment of Labour at NFL site:</b>				
a			The vendor will employ only his regular skilled/ semi skilled/ unskilled employees with experience in erection & commissioning of supplied control system. No person below the age of 18 years shall be employed. The vendor shall pay to his employees/workers the minimum wages as per, MP State Government notification issued from time to time.		
b			All notices and instructions issued by the owner must be strictly adhered to by the contractor and his employees and shall conform to all rules of conduct, etc. established by owners. Failure to do so will be sufficient cause for removal of such person from the site.		
c			vendor will take umbrella insurance cover for all his employees for all purposes of claims under Workman's Compensation Act during stay at Owner site and shall submit a copy of the same to the owner. The expenditure incurred for insurance shall be to the contractor's account.		
d			In case the Owner becomes liable to pay any dues to the labour or to any Government Agency or any other agency under any of the provision of the Minimum wages Act, Workmen compensation Act or any other law due to act of omission of the vendor, the owner shall recover the same from the vendor bills.		
28.4	<b>Working and Safety Regulations:</b>				
a			The vendor shall fulfill all statutory and legal requirements enforced by Central, State Governments and local authorities applying to the work as well as safety requirements for the same.		
b			The vendor shall strictly follow regulations laid down by owner, Factory Inspector, Government and state authorities in all respects.		
c			Compliance with all electricity safety regulations.		
d			Explosive material/equipment prone to explosion shall not be allowed inside the owner premises.		

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