

GAS CHROMATOGRAPH

ANNEXURE-A

Gas Chromatograph with TCD, FID & Methanizer as below for NFL Bhatinda, Panipat & Nangal Unit (one each):

i) Gas Chromatograph customized & factory fitted capable of concurrent (parallel) operations of TCD and FID having below mentioned specifications:
Quantity=3 Nos.

ii) PC based works station with monitor and printer having below mentioned specifications:
Quantity=3 Nos.

iii) Methanizer factory fitted having below mentioned specifications.
Quantity=3 Nos.

SPECIFICATIONS:

All the Gas Chromatographs should be PC based capable of concurrent (parallel) operations of both TCD & FID, column injector ports & detectors. The system should have independent carrier gas flow system for simultaneous use of TCD and FID in parallel and should be customized with check out standard and must have factory fitted column, detector, methanizer, automatic valves and digital electronic flow controller etc. and must be able to analyze the following gas mixtures simultaneously in a single run:

By TCD:

Ar + O ₂	:	0.01	to	22%
N ₂	:	0.01	to	99.5 %
CO	:	0.01	to	20%
CH ₄	:	0.01	to	50%
CO ₂	:	0.01	to	99.5%
NH ₃	:	01	to	25%
H ₂	:	0.50	to	80% (by difference)

By FID with Methanizer: CO, CO₂ and CH₄-with the range of 0.50 to 20.0 ppm in synthesis gas etc. containing gas mixture of O₂+ Ar, N₂, CO, CO₂, CH₄ & H₂

DISPLAY:

Built-in digital display with provision to display, temperature, pressure & flow of Col. Over, injector & detector etc.

Installation Kit: Complete with SS tubing, SS joints, nut & ferrules o- rings, adopters for injector & detector side leak detection solution, screw drivers & spanners etc. and also one set of spare imported columns used for above applications on TCD & FID.

Operating Power:

230V ± 10 %, 50 Hz AC

COLUMN OVEN: Column Oven should be capable of accommodating all the columns required for above mentioned applications.

1. Temp : From ambient +10 °C to 400 °C
2. Temp. Program : Ramps 3 or more.
3. Max. heating Rate : 100° C / minute or better

4. Cool down rate : 300 °C to 50° C in 6 minute or better
 5. Temp. set point resolution : 1°C or better

INJECTION PORT: Independent packed column injection port for TCD and FID suitable for above mentioned applications. Temperature range up to 400°C or better.

Thermal Conductivity Detector (TCD)

- i. Max temp. : 400°C or better
 ii. Detectivity : 300-500 pg/ml (butane) or better
 iii. Peak area repeatability : 1% or better
 iv. Peak retention time repeatability: 0.01% or better
 v. Filament protection and automatic bridge balancing.

Flame Ionization Detector (FID)

- i. Max. Temp. : 400 °C or better
 ii. Detectivity : 3 pg °C/sec
 iii. Peak area repeatability : 1% or better
 iv. Peak retention time repeatability: 0.01% or better
 v. Press. Range : Up to 100 psi or better
 vi. Built in Auto Ignition and Flame out detection”.

Methanizer:

Factory fitted methanizer capable of analyzing CO, CO₂ and CH₄-with the range of 0.50 to 20.0 ppm in synthesis gas etc. containing gas mixture of O₂+ Ar, N₂, CH₄ & H₂

❖ **Columns: Suitable required columns capable of separating analytical constituents as mentioned above.**

INSTALLATION & CALIBERATION OF GAS CHROMATOGRAPH

a)The customized gas chromatograph should be factory fitted and calibrated at principle works with a check out standard of below mentioned ranges (The same imported standards shall also be supplied by the party as per Check Standard).

CHECK STANDARD - I	CHECK STANDARD - 2	CHECK STANDARD - 3
Ar = 0.2 to 0.3%	Ar = 3 to 5 %,	Ar = 0.3 to 0.5 %
N2= 22 to 24%	N2= 18 to 21 %	N2= 20 to 25%
CO= 10 to 12%	CO= NOT APPLICABLE	CO= 1 T0 10 PPM
CH4 = 0.3 to 0.5 %	CH4 = 8 to 10 %	CH4 = 0.5 to 1.0 %
CO2= 8 to 10%	CO2= NOT APPLICABLE	CO2= 1 T0 10 PPM
H2 =Balance(By difference)	H2 =Balance(By difference)	H2 = 73 to 75 %
Carrier Gas = H2 / He	Carrier Gas = H2 / He	Carrier Gas = H2 / He
Detector = TCD	Detector = TCD	Detector = FID with Methanizer
	NH3= 4to 6%	

- The demonstration of gas chromatograph should also be given by the party service Engineer at NFL Bhatinda, Panipat and Nangal Unit.

- The party shall mention the specific Model No. to be supplied with literature.
- The party should submit Complete flow diagram indicating : Injector port, automatic valves, sample loop, column & detector etc. for TCD & FID.
- The party should submit complete chromatogram each for TCD & FID (Chromatogram only for CO & CO2) indicating Name, RT etc. for all constituents mentioned in the check standards, operating conditions e.g. col. oven, injector & detector flow & temp .etc.
- The party should submit the complete analysis report for above mentioned standards indicating Name , RT,Area , percentage composition etc. of all the constituents.

CHECK STANDARD

Check out Standard 2 to 3 litre capacity each for Standard -1, 2 & 3 as per composition mentioned above is to be supplied by the party free of cost along with the Gas Chromatograph and the calibration of the Gas Chromatograph should also be carried out by the party service engineer at NFL Bhatinda, Panipat and Nangal Unit .

Software

Latest original & Licensed Software, with a CD. Software should be user friendly & easy to use and must be capable to fully control the GC through PC.

PC BASED WORK STATION

Latest configuration PC HP/IBM /ACER /WIPRO/DELL, CPU-Intel core 2duo,8400, 3GHz, Chipset Intel Q-35 on OEM motherboard, Memory-3GB 667 MHz DDR2 RAM, HDD 500 GB,7200 RPM, DVD writer Drive , Net Working facility, Window 7.

MONITOR 43.2 cms TFT Digital Colour

LASER PRINTER: Monochrome 600x600 dpi, paper size A4,printing speed 32 PPM

Power Chord

Certified GAS CHROMATOGRAPH power chord to ensure safe operation.

Environmental Conditions

1. Operating temp. 10c to 50 °c
2. Relative Humidity: 5 to 95 %

Instruction, Operational & Service manual - Two Sets Each in hard copy

Training:

Training: Minimum four days training (including operation of Gas Chromatograph and Software) by trained application Engineers to Lab Staff at NFL Bhatinda, Panipat and Nangal Units free of cost.

After sales service : After sales services at no extra cost for a period of 2 years (two visits per year) from the date of expiry of Warranty Period.

Supply of Spares

You shall assure the supply of electronic spares and consumables etc. for a period of minimum 7 years from the date of the installation of the Gas Chromatograph system.

Guarantee/ Warranty:-Full 48 months Guarantee/warranty for complete Gas Chromatograph system from the date of successful commissioning of analyser. During the warranty period the party service

engineer should visit NFL, Bathinda, Panipat & Nangal Units minimum twice a year for preventive maintenance.

Client List & Performance certificate: from two users.

Specifications of Gas Chromatograph with TCD,FID without Methanizer**Qty.: - 02 (Two) Nos. one each for NFL Panipat & Nangal Unit****GAS CHROMATOGRAPH having following:**

- i) Gas Chromatograph customized & factory fitted capable to operations of TCD and FID having below mentioned specifications:
Quantity=2 Nos.
- ii) PC based works station with monitor and printer having below mentioned specifications:
Quantity=2 Nos.

SPEFICATIONS:

All the Gas Chromatographs should be PC based capable of operations of both TCD & FID, column, injector ports & detectors. The system should have independent carrier gas flow system for use of TCD and FID to analyze the following gas mixtures separately:

Column Oven:

1. Temp : From ambient +10 °C to 400 °C
2. Temp. Program : Ramps / holds: 3 or more.
3. Max. Temp. Rate : 100° C / minute at 230+ 10 voltages or better
4. Cool down rate : 300 °C to 50° C in 6 minute or better
5. Temp. set point resolution : 1°C or better

Thermal Conductivity Detector (TCD)

1. Max temp. : 400 °C or better
2. Detectivity : 500 pg / ml (butane) or better
3. Linear Dynamic Range : 10⁵ or more
4. Peak area Repeatability : 1% or better
5. Filament protection and automatic bridge balancing.
6. Packed column capable of analyzing separately Ar + O₂,N₂,CO, CH₄,CO₂ & H₂ in the following range

Ar + O ₂ :	0.01	to	22%
N ₂ :	0.01	to	99.5 %
CO :	0.01	to	20%
CH ₄ :	0.01	to	50%
CO ₂ :	0.01	to	99.5%
H ₂ :	0.50	to	80%

Column should be capable of separating analytical constituents as mentioned above.

Flame Ionization Detector (FID)

- i. Max. Temp. 400°C or better
- ii Detectivity : 3 pg °C/sec or better
- iii Linear Dynamic Range: 10⁵or better
- iv Peak area Repeatability 1% or better
- v Built in Auto Ignition and flame out detection

Injection Port:

- i. Type- Independent packed column injection port for TCD & FID
- ii. Temp. Range: 400°C or better
- iii. Heating Setting: 1°C steps

INSTALLATION & CALIBRATION OF GAS CHROMATOGRAPH

The customized gas chromatograph should be factory fitted and calibrated at principle works with a check standard of below mentioned ranges (The same standards shall also be supplied by the party (as per Check Standard)).

CHECK STANDARD - I	CHECK STANDARD - 2
Ar = 0.2 to 0.3%	Ar = 3 to 5 %
N2= 22 to 24%	N2= 18 to 21 %
CO= 10 to 12%	CO= NOT APPLICABLE
CH4 = 0.3 to 0.5 %	CH4 = 8 to 10 %
CO2= 8 to 10%	CO2= NOT APPLICABLE
H2 =Balance(By difference)	H2 =Balance(By difference)
Carrier Gas = H2 / He	Carrier Gas = H2 / He
Detector = TCD	Detector = TCD

Power Chord: Certified GAS CHROMATOGRAPH power chord to ensure safe operation.

Environmental Conditions

- 1. Operating temp. 1°C to 50 °c
- 2. Relative Humidity: 5 to 95 %

Data Processing

Latest original & Licensed Software in the form of CD GAS CHROMATOGRAPH control, real time chromatograph data display, post run analysis etc. Software should be user friendly & easy to use.

Display : Built-in digital display with provision for displaying, temperature, pressure & flow rates of Col. Oven injector etc.

Installation Kit

Complete with SS tubing, SS joints, union, nut & ferrules, O-rings, adapters for injector & detector side, leak detection solution, screw drivers & spanners etc. and also one set of spare columns used for above application on TCD, FID.

Operating Power: 230V +/- 10 %, 50 Hz AC

- The demonstration of gas chromatograph should also be given by the party service Engg. at NFL Panipat & Nangal Unit.
- The party shall mention the specific Model No. to be supplied with literature.
- The party should submit Complete flow diagram indicating : Injector port, automatic valves, sample loop, column & detector etc. for TCD & FID.
- The party should submit complete chromatogram each for TCD & FID indicating Name, RT etc., for all constituents mentioned in the check standards, operating conditions e.g. col. Oven Injector &

& detector flow & temp .etc.
<ul style="list-style-type: none"> The party should submit the complete analysis report for above mentioned standards indicating Name , RT,Area , percentage composition etc. of all the constituents.
CHECK STANDARD
Check out Standard 2 to 3 litre capacity each for Standard -1& 2 as per composition mentioned as above to be supplied by the party free of cost along with the Gas Chromatograph. The calibration of the Gas Chromatograph should also be carried out by the party service engineer at NFL Panipat and Nangal Unit.
Instruction, Operational & Service manual - Two Sets Each in hard copy
Training: Minimum 4 days training (including operation of Gas Chromatograph & software) by trained Application Engineers to Lab Staff at NFL Panipat and Nangal Unit free of cost.
After sales service: After sales services at no extra cost for a period of 2 years (two visits per year) from the date of expiry of Warranty Period.
Supply of Spares: You shall assure the supply of electronic spares and consumables etc. for a period of minimum 7 years from the date of the installation of the Gas Chromatograph system.
PC BASED WORK STATION Latest configuration PC HP/IBM /ACER /WIPRO/DELL,CPU-Intel core 2duo,8400, 3GHz, Chipset Intel Q-35 on OEM motherboard,Memory-3GB 667 MHz DDR2 RAM, HDD 500 GB,7200 RPM,DVD writer Drive , Net Working facility, Window 7. MONITOR 43.2 cms TFT Digital Colour LASER PRINTER: Monochrome 600x600 dpi, paper size A4,printing speed 32 PPM
Guarantee/ Warranty:- Full 48 months Guarantee/warranty for complete Gas Chromatograph system including software from the date of successful commissioning of analyser. During the warranty period the party service engineer should visit NFL Nangal & Panipat twice a year for preventive maintenance with spares required free of cost.
Client List & Performance certificate: from users.

DGM (Mtls),
National Fertilizers Ltd.,
Nangal Unit, Naya Nangal-140126

UNDERTAKING

Sub: Your Tender Notice No. PRJ/2012/33 DUE ON _____ for Supply of Gas Chromatograph.

Dear Sir,

With reference to above we hereby confirm that-

1. Tender documents have been read, understood with all clarifications pertaining to various clauses provided therein.
2. Terms & conditions laid out in the tender documents are fully acceptable to us and we have signed each page of the tender documents as a token of acceptance of the same.
3. No deviation to any of the terms & conditions of NIT has been quoted by us.
4. Our offer is valid for acceptance for a period of 90 days from the date of opening.
5. Earnest Money Deposit is enclosed with the following details (in case, the EMD has been deposited through more than one DD the details may be furnished separately).

DD No. _____ Dated _____ Amount _____

Drawn on (Bank) _____ payable at Naya Nangal/ Nangal

6. Rates quoted are on FOR, NFL Stores basis and the rates including transportation charges shall remain firm till the complete execution of the order.
7. This is to certify that none of the NFL employees is related to us. (In case any relative is working NFL, furnish details separately).
8. That no other firm/ sister concern / associate belonging to the same group is participating / submitting this tender.
9. That the bidder's, their associates, sister concern, etc. have not been black listed by any Institutional agency/ Govt. Deptt. / Public sector undertaking in the last two years. In case of concealment of any fact, if detected later on such tenderer will be debarred from all future dealing with NFL".

Dated:

Signature of Tenderer or

Place:

Their Authorised Representative: _____

Name & Address of Tenderer: _____

Phone No.: _____

FAX No. : _____

E.Mail : _____

PROFORMA FOR PRICE BID

The DGM (Matls.)
National Fertilizers Ltd.,
Nangal unit, Naya Nangal
PIN- 140126 (P.B)

Sub:- Your Tender No. PRJ/2012/33 DUE ON _____ for Supply of Gas Chromatographs to Nangal, Bhatinda and Panipat Units.

Dear Sir,

With reference to above-mentioned tender, we hereby submit our Price Bid for subject material as under:

Sr. No.	Description	For Nangal Unit		For Panipat Unit		For Bathinda Unit
		Gas Chromatograph with Methanizer	Gas Chromatograph With-out Methanizer	Gas Chromatograph With Methanizer	Gas Chromatograph With-out Methanizer	Gas Chromatograph With Methanizer
1.	Quantity	1 No.	1 No.	1 No.	1 No.	1 No.
2.	Basic Price of Equipment					
3.	Packing & Forwarding Charges					
4.	Excise Duty					
5.	CST/ VAT					
6.	Freight Charges					
7.	Other Charges, if any					

Dated:

Signature of Tenderer or
Their Authorized Representative: _____
Name & Address of Tenderer: _____

Place:

Phone No: _____
Fax no.: _____
E-Mail: _____

ELIGIBILITY CRITERIA

The price bids of only such eligible tenderers shall be opened whose offer meet the NIT specifications and also fulfill the following:-

1. Vendor should be manufacturer of similar Gas Chromatograph for the last 5 years ending 31.03.2012.
2. Bidder must have experience of supply of similar Gas Chromatograph to a reputed Fertilizer / Chemical Organization. Minimum 03 copies of P.Os, executed during last 07 years (ending 31.03.2012) shall be submitted by the bidder in this regard.
3. Bidder must submit at least one Performance Certificate for the similar Gas Chromatograph supplied during last 07 years ending 31.03.2012.
4. Specific part such that TCD, FID & Methanizer etc. should be of bidder/their principal's make & confirmation to this effect should be submitted along with the offer.
5. The vendor shall have to furnish Last 3 Years Balance Sheet/ Audited results/Profit & Loss account (ending 31/03/2012).

(Documents in support of the above must be submitted along with Techno-Commercial Bid i.e. Part-I)

CHECK LIST FOR BIDDERS

Sr. No.	Points to be seen while preparing bid	
1	Bid in Two Parts (Technical & Price separately)	
2	Price quoted for each type of Gas Chromatograph for all three Units in price bid	
3	Earnest Money Deposit	
4	Security Deposit	
5	Performance Bank Guarantee	
6	Guarantee/ warranty	
7	Payment Terms	
8	Excise Duty	
9	Acceptance of Liquidity Damages	
10	CST against form "C"/ VAT	
11	Validity of offer	
12	Delivery Period	
13	2 years after Sale Service	
14	Training to NFL staff	
15	Installation & Demonstration	
16	Availability of Spares for 7 years after installation of Gas Chromatograph	
17	MSMED Confirmation	