



Global Tender Document

Tender No.: CEH/SRO/2024/Global/0002

For

**“Supply of Two-dimensional gas chromatography
(GCxGC) system with Mass spectrometer
(MS) and Flame Ionization Detectors (FID)”**

**Center of Excellence in Hypersonics
Indian Institute of Science, Bangalore – 560012**

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1. Tender Notification

Tender No.: CEH/SRO/2024/Global/0002

Scope of Work	Supply of Two-dimensional gas chromatography (GCxGC) system with Mass spectrometer (MS) and Flame Ionization Detectors (FID)
Estimated Period of Work Completion	4 (six) Months
Name of the Client	Indian Institute of Science, Bangalore
Address of the Client	The Chairman Center of Excellence in Hypersonics Indian Institute of Science Bangalore - 560 012
Contact Person/Client Representative	Prof. Srisha Rao M V Associate Professor Department of Aerospace Engineering, IISc. Phone: 080-22932426 Email: srisharao@iisc.ac.in
Tender Fee	NIL
Date of Publishing	10 th January 2025
Last date and Time for online submission (uploading) of tender	31 st January 2025, 05.00 PM
Date and Time of opening of Tender	03 rd February 2025, 11.00 AM

2. General Conditions

The Chairman, Center of Excellence in Hypersonics, Indian Institute of Science invites tenders in two bid (Technical and Financial) system from eligible global bidders, for **“Supply of Two-dimensional gas chromatography (GCxGC) system with Mass spectrometer (MS) and Flame Ionization Detectors (FID)”**.

2.1	Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Government of India or any State Government of Union of India. (authorized signatory should provide an undertaking). Tenders from Joint ventures are not acceptable.
2.2	All Bidders shall provide the required information accurately and enough as per details in Section 4: Eligibility Criteria
2.3	The rates quoted should reflect Shipping charges, CIP charges, taxes separately. However, bid evaluation will be done inclusive of all Taxes / Cess. / Royalty etc. The statutory levies as per Govt. guidelines will be deducted. The IISc reserves the right to accept / reject any or all the tenders without assigning any reasons.
2.4	The quotations should be on CIP-IISc Bangalore basis.
2.5	Any statutory increase in the taxes and duties subsequent to the bidder’s offer, if it takes place within the original contractual delivery date, will be borne by IISc, Bangalore, subject to the claim being supported by documentary evidence. However, if any decrease takes place, the advantage will have to be passed on to IISc, Bangalore. Any information furnished by the bidder found to be incorrect, either immediately or at a later date, would render the bidder liable to be debarred from the bidding process.
2.6	Conditional tenders will not be accepted and is liable for rejection.
2.7	Even though the Bidders meet the eligibility criteria, they are subject to be disqualified if they have: <ul style="list-style-type: none"> – Made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or – Record of poor performance such as abandoning the works, not properly completed the contract, inordinate delays in completion, litigation history, or financial failures etc. – Additionally, IISc shall have the absolute right to take the opinion of other departments/institutes for their opinion/experience about the bidder’s services/sales. Based on such input, IISc may decide about the rejection of a bid of such bidder(s).
2.8	The Tender document can be downloaded from IISc website (https://iisc.ac.in/all-tenders/) It may be noted that all subsequent notifications, changes and amendments on the project/document would be posted only on the same website. The bidders are advised to visit the IISc Portal and get familiarized with the procedure for submission of the tenders.
2.9	Content of Tender documents The bidders should go through the Tender Document and submit online response through IISc portal only
2.10	Amendment of Tender documents Before the deadline for submission of tenders, the IISc may modify the tender documents by issuing corrigendum / addendum. Such corrigendum/ addendum thus issued shall be part of the tender documents and shall be published online in IISc portal.
2.11	Documents comprising the Tender The Technical Bid submitted by the Bidder shall contain the documents as follows: <ul style="list-style-type: none"> a) Proof of previous experience in similar work (as per eligibility criteria)

	<p>b) Other documents citing aspects fulfilling eligibility criteria.</p> <p>c) Technical Compliance sheet in tabular form showing compliance to the technical specifications in Section 3</p> <p>The Financial Bid:</p> <p>a) Provide prices of individual items on per unit basis followed by total cost as per numbers.</p> <p>b) Price quoted shall be inclusive of all discounts.</p> <p>c) All prevailing duties, taxes, and other levies like CESS/Royalty payable by the contractor under the contract, or for any other cause, shall be included in the rates, prices and total Tender Price submitted by the Bidder.</p>
2.12	<p>Tender validity</p> <p>Tenders shall remain valid for a period not less than 180 days after the deadline date for tender submission. A tender valid for a shorter period shall be rejected by the IISc as non-responsive. In exceptional circumstances, prior to expiry of the original time limit, IISc may request that the Bidders may extend the period of validity for a specified additional period. The request and the Bidders' responses shall be made in writing or by email.</p>
2.13	<p>Deadline for submission of the Tenders</p> <p>The Bidder shall submit a set of hard copies of all the documents in two separate covers sealed and marked as “Technical Bid” and “Financial bid” to IISc, on or before 31st January 2025.</p> <p>The IISc may extend the deadline for submission of tenders by issuing an amendment, in which case all rights and obligations of the IISc and the Bidders previously subject to the original deadline will then be subject to the new deadline.</p>
2.14	<p>Modification and Withdrawal of Tenders</p> <p>Bidder has all the time to modify and correct till last date and time for Bid submission, as published .</p> <p>The Bidder may withdraw his tender before the notified last date and time of tender submission. No Tender may be modified after the deadline for submission of tenders.</p>
2.15	<p>Clarification of Tenders</p> <p>To assist in the examination, evaluation, the IISc may, at its discretion, ask any Bidder for clarification of his/her Tender. The request for clarification and the response shall be in writing or by e-mail along with the section number, page number and subject of clarification, but no change in the price or substance of the Tender shall be sought, offered, or permitted.</p> <p>Any effort by the Bidder to influence the IISc in the Tender evaluation, or contract award decisions may result in the rejection of the Bidders' Tender.</p>
2.16	<p>Examination of Tenders and determination of responsiveness</p> <p>Prior to the detailed evaluation of Tenders, the IISc will determine whether each tender (a) meets the eligibility criteria, and (b) is substantially responsive to the requirements of the Tender documents.</p> <p>A substantially responsive tender is one which conforms to all the terms, conditions, and specifications of the Tender documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the tender documents, the IISc's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Tenders.</p> <p>If a tender is not substantially responsive, it will be rejected by the IISc, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation</p>

	or reservation.
2.17	<p>Award criteria</p> <p>IISc will award the contract to the Bidder whose Tender has been determined to be substantially responsive to the tender documents and who has offered the lowest evaluated tender price. After technical evaluation the technically qualified bidders will be considered for opening of the financial bids provided that such bidder has been determined to be eligible in accordance with the provisions of this tender document and subsequent technical clarifications offered by the responsive bidders.</p>
2.18	<p>Right to accept any Tender and to reject any or all Tenders</p> <p>IISc reserves the right to accept or reject any Tender, and to cancel the Tender process and reject all Tenders, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the IISc's action.</p>
2.19	<p>Notification of award</p> <p>The Bidder whose Tender has been accepted will be notified of the award by the IISc prior to expiration of the Tender validity period by e-mail or confirmed by letter.</p>
2.20	<p>Cancellation of Tender:</p> <p>Notwithstanding anything specified in this tender document, the purchase committee, IISc Bangalore, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:</p> <ol style="list-style-type: none"> To accept OR reject lowest tender or any other tender or all the tenders. To accept any tender in full or in part. To reject the tender, offer not confirming to the tender terms.
2.21	<p>Comprehensive Maintenance Contract:</p> <p>An annual maintenance contract for a period of atleast 2 years post warranty should be provided on completion of warranty period. If the equipment cost is A, CMC is B, the lowest bid will be calculated as $L1=A+5*B$.</p>
2.22	<p>Delivery, Installation and Training:</p> <p>The bidder shall provide the lead time to delivery, installation and made functional at IISc, Bangalore from the date of receipt of purchase order. The system should be delivered, installed and made functional within 120 days from the date of receipt of purchase order. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and inspection of all the items and features/capabilities tested by the IISc, Bangalore. After successful installation and inspection, the date of taking over of entire system by the IISc, Bangalore shall be taken as the start of the warranty period. No partial shipment is allowed.</p> <p>The bidder should also arrange for technical training to the local facility technologists and users.</p>
2.23	<p>Payment Terms:</p> <p>The payments to non domestic vendors will be through a Letter of Credit and milestone of the payment will be determined after the mutual discussions with the successful bidder. As per GFR no advance payment can be made to domestic vendors, unless an equal amount of bank guarantee is provided.</p>
2.24	<p>Statutory Variation:</p> <p>Any statutory increase in the taxes and duties subsequent to bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc, Bangalore subject to the claim being supported by documentary evidence. However, if any decrease takes place the advantage will have to be passed on to IISc, Bangalore.</p>

2.25

Disputes and Jurisdiction:

Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Bangalore, India.

3. Technical Specifications

Mandatory Specifications of two-dimensional gas chromatography (GCxGC) system

S.No.	Item	Description
1	Gas Chromatograph	<ul style="list-style-type: none"> Column Oven can accommodate two columns with maximum temperature range up to 450 °C with set point resolution of 0.1 °C. It should support 15 ramps & maximum temperature ramp rate of 100 °C/min. Cool down of Oven from 400 °C to 50 °C in less than 5 minutes. Auto retention time adjustment feature or retention time locking/equivalent feature Touch screen display Reverse Flow modulator Gas sampling valves for Gas introduction
2	Inlets	<ul style="list-style-type: none"> Inert Split, Splitless Injector for split, splitless with fully EPC and pressure range up to 100 psi. Maximum temperature should be 400 °C. 2 quantity. Software controlled Sample splitter for simultaneous detection of samples in two detectors (MS and FID) shall be provided – 1 no
3	Auto Sampler/Injector	<ul style="list-style-type: none"> Auto sample injection device Software controlled sampler. 2 ml vial volume for liquid injection. Vial capacity for both should be 10 nos or more.
4	Flame Ionization Detector (FID) – 1 No	<ul style="list-style-type: none"> Maximum temperature should be 400 °C or more. Minimum detection limit should be as low as 1.2 pg C/sec or better. Data acquisition rate of more than 500 Hz. Flameout detection and re-ignition should be possible.
6	Mass Spectrometer	<ul style="list-style-type: none"> Electron Ionization (EI) source with maximum temperature of 300 °C or better. Dual Filament design. Variable Electron energy from 50-200 eV is preferred but the ability to have 70 eV set-point is mandatory. Mass Analyzer: Single heated Quadrupole or Prefilter or pre-rod with quadrupole system Feature for self cleaning the ionization source, but not mandatory
7	Mass Range	<ul style="list-style-type: none"> 15 to 1,050 m/z
8	Scan Rate	<ul style="list-style-type: none"> Scan rate of 18000 amu/sec or more.

9	Sensitivity	<ul style="list-style-type: none"> • EI scan sensitivity 2000:1, by 1 microliter injection of 1 pg/ul OFN standard scanning from 50 to 300 amu at nominal 272
10	Instrument detection limit (IDL)	<ul style="list-style-type: none"> • Less than 10 fg with the injection of 100 fg OFN. IDL should be demonstrated at installation and proof of data in company's specification sheet.
11	Turbo Molecular Pump	<ul style="list-style-type: none"> • Turbo molecular pump with capacity of 250L/sec or more.
12	Library	<ul style="list-style-type: none"> • Latest NIST library with licensed version with part number.
13	Software	<ul style="list-style-type: none"> • Original software with license to control GCMS • GC image or similar software- 1 qty.
14	Columns	<ul style="list-style-type: none"> • First dimension column and second dimension columns: <ol style="list-style-type: none"> 1) 20 m, 0.18 mm, 0.18 μm: DB-5MS or similar column and 5 m, 0.25 mm, 0.25 μm DB-17MS or Similar type of columns 2) 30 m, 0.25 mm, 0.25 μm: DM-17MS or similar column and 0.8 m , 0.25 mm, 0.25 μm, DB-1MS or similar type of column
15	Consumables	<ul style="list-style-type: none"> • Screw cap vial – 100 nos. • 10 ul syringe – 2 nos • Ferrule, 0.5mm Graphite 0.32 col – 20 nos • Ferrule, 0.4mm VG cond 0.25 col – 20 nos • Ferrule 0.53mm id column – 20 nos • Septa Non-Stick BTO Inlet 11mm 20 nos • Column Nut for MS interface – 4 nos • Column nut, universal – 4 nos • Glass wool pesticide - 10gm • Liner, UI, split, straight, Glass Wool, - 5 nos • Liner, UI, spltls, sngl tpr, no wool - 5 nos • EI Filament – 2 nos • FID Jet, universal fit – 1 nos • Syr. 10ul tapered, FN 23-26s/42/HP, 2 nos • GCMS Tuning Standard – PFTBA, 1 no • GCMS Tool Kit and cleaning, 1 no • Gas purification trap for Helium – 1 nos • Vacuum oil – 2 L • Liner O-ring – 10 nos.
16	Warranty	<ul style="list-style-type: none"> • 3 Year warranty on complete instrument.
17	Installation and Training	<ul style="list-style-type: none"> • All the quoted specifications must be experimentally proved during installation and training.

Standard Analysis Capabilities

S.N.	Item	Specification
1	Phase of molecules for analysis, injection and End-connection	The GCxGC system must be capable of analyzing both gaseous and liquid samples. Gaseous samples should be introduced through a pneumatic valve (e.g., a 6-port pneumatic valve with a sample loop) with standard end connections available with Swagelok for gas inlet, while liquid samples shall be injected using the autosamplers. If the end-connection for gas inlet is not available in Swagelok catalog, the type of connection required should be mentioned. It is preferable that the pneumatic valve could be heated to a minimum of 120 °C.
2	Range of hydrocarbon detection requirement	The GCxGC system should be able to detect a range of gaseous hydrocarbon mixtures, including methane, ethane, ethylene, propane, propyne, butane, and butene, along with vaporized liquid samples such as benzene, toluene, and xylene, all in a single injection using both MS and FID. Any limitations of the MS in identifying lower hydrocarbons in GCxGC mode should be addressed by the FID, thus avoiding the need for multiple injections. For a given injection, either a gaseous or a liquid sample mixture will be injected, but not both simultaneously.
3	Modes of Operation	GCxGC should also have the ability to work in normal GC-MS and GC-FID mode of operation Cryogen-free operation for routine GCXGC.
4	Demonstration	Resolved Paraffin, Olefins, Naphthenes, and Aromatics functional group molecules of Diesel or similar fuel should be demonstrated at the time of installation
5	Analyte Transfer	Complete transfer of analytes from the 1D to the 2D column, or a well-defined, repeatable, and known concentration transfer of analytes from the 1D to the 2D column.
6	Repeatability	Repeatability of rigid retention time and peak area RSDs should be less than 5%
7	Detectors	MS and FID is mandatory. Number of available detector slots. Feasibility of connecting Thermal Conductivity Detector (TCD) and/or (Electron Capture Detector) ECD along with the MS and FID should be mentioned.
8	Duration Service Availability	Year GC commercial introduction should be specified along with assured number of assured serviceable years from the date of installation needs to be mentioned.

9	UPS requirement	Input and output phase requirement for the UPS needs to mentioned
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Software Features

- The software should save the chromatogram up to the stoppage time when the user decides to abort the run at any point.
- Flexible Graphical User Interface to display instrument status, show real time plot and change all instrument set points.
- Software should record and display data in absolute numbers and not as a normalized value.
- The software should offer a variety of interactive visualizations for example: 1D graphs, 2D chromatogram views, 3D views, and tabular views.
- Software should have the ability to draw a mesh/line/polygon between peaks to separate functional groups of the molecules.
- The software should support data from a wide range of multispectral detectors, including MS, FID and TCD. An array of tools support spectral matching, library search, and selected ions/channels analysis, with options for handling adducts.
- The Project interface should support managing and batch processing sequences of runs, and generates and exports reports to external software such as Excel
- Displayed and saved data should be in absolute values (for ex. Total Ion for MS) and not as normalized values.
- Other software features that can help in functioning of GCxGC that might be proprietary to the company should be mentioned.

Technical Documents

Supporting document in the form of Application note and/or published literature of 2D chromatogram showing Paraffin, Olefins, Naphthenes, and Aromatics molecules of JP-7 or JP-8 or RP-7 or Gasoline or Diesel or similar fuels should be attached as part of Technical bid. It also needs to include data to support possibility to calibrate GCxGC system (detectors) for components of such fuels. For example Toluene, xylene, decane, isododecane, tetradecane etc.

Software Manual/Brochure or Documentation to illustrate its ability to analyze 2D GCxGC data.

Installation and Training

1	The Two-dimensional gas chromatography (GCxGC) system with Mass spectrometer (MS) and Flame Ionization Detectors (FID) should be installed by a technical expert of either the manufacturer or their authorized Indian technician.
2	Complete training should be given on the operation, and maintenance of the Two-dimensional gas chromatography (GCxGC) system with Mass spectrometer (MS) and Flame Ionization Detectors (FID).
3	All the quoted specifications must be experimentally proved during installation and training.

Warranty

1	<p>Warranty conditions:</p> <ul style="list-style-type: none"> • Comprehensive Warranty covering all mandatory parts in this tender of at least 36 months from the date of complete onsite installation. • The Bidders should clearly document warranty conditions in the tender document including accessories.
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Optional Items

1	Compatible branded PC should directly come from the factory with instrument
2	TCD (detector)
3	ECD (detector)
4	Required Gas panels and tubing from the gas cylinder.
5	Any unit/ assembly of units that allows the user have the possibility to heat the gas sampling valve and gas lines in the GC to more than 120 °C. If the gas sampling valve needs any additional accessories, its cost can be included in the unit/assembly of units
6	A valve or any component that can automatically stop and start the flow of “Test gas mixture” after it filled inside the sample loop of the gas sampling valve. Here Test gas mixture refers to gases that are expected to be separated in the GCxGC system.
7	Auto sampler with self-dilution without compromising the sensitivity of the detection, including area of the peak, retention time and shape of the peak.
8	2 years CMC

Delivery

1	Within 4 months from the release of the Purchase Order
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Commercial Bid Price Break Up

In the commercial bid, please provide the price of individual components, preferably in the following manner.

1. Two-dimensional gas chromatography (GCxGC) system with all mandatory items, per unit cost and total cost.
2. Optional items
3. Shipping Charges
4. CIP Charges.

4. Eligibility Criteria

Sl. No	Requirement	Compliance
1	Only the Original Equipment Manufacturer or their authorized representatives across the globe shall participate in the bid.	NA
2	The order will be placed only on the bidder who participated in the bid.	NA
3	History of having supplied similar of Two-dimensional gas chromatography (GCxGC) systems to other Government organizations/Educational Institutes. A list of such purchases must be supplied.	Yes/No
4	The bidder must show through demonstration/video/publications, the capability of the GCxGC system to resolve functional groups of Diesel or Petrol or RP7 or JP8 or JP 7 or similar fuels.	Yes/No
5	Technically trained manpower who can install the GC x GC system onsite and provide a demonstration of the working system with a user supplied kerosene-based fuel	Yes/No
6	Technically trained manpower to provide training to end users at IISc	Yes/No

Annexure 1:

Details of the Bidder: The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

Sr. No.	Type	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

(Signature of the Bidder)

Name:

Designation, Seal

Date:

Annexure 2:

Declaration regarding experience

To,

The Chairman,
Center of Excellence in Hypersonics
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Prof. Srisha Rao M V

Ref: Tender No:

Dated:

Sub: Supply of two-dimensional gas chromatography (GCxGC) system with Mass spectrometer and Flame Ionization Detectors

I have carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has----- years of experience in supplying and installing GCxGC system. As proof of GCxGC systems' ability to carry out Paraffin, Olefins, Naphthenes, and Aromatics analysis technical document(s) are attached in the Technical bid.

(Signature of the Bidder)

Name:

Designation, Seal

Date:

(Signature of the OEM)

Name:

Designation, Seal

Date:

Annexure 3:

Declaration of track record

To,
The Chairman,
Center of Excellence in Hypersonics
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Prof. Srisha Rao M V

Ref: Tender No:

Dated:

Sub: Supply of two-dimensional gas chromatography (GCxGC) system with Mass spectrometer and Flame Ionization Detectors

Sir,

I have carefully gone through the Terms & Conditions contained in the above referred tender.

I hereby declare that my company / firm is not currently debarred / blacklisted by any Government / Semi-Government organizations / institutions in India or abroad. I further certify that I am competent officer in my company / firm to make this declaration.

OR

I declare the following:

Sr. No.	Country in which the company is debarred/ blacklisted / having pending case	Blacklisted / debarred by Government / Semi Government Organizations or Institutions / having pending case	Reason	Time Period

(Note: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

(Signature of the Bidder)

Name:

Designation, Seal

Date:

Annexure 4:

Declaration of acceptance of terms and conditions

To,
The Chairman,
Center of Excellence in Hypersonics
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Prof. Srisha Rao M V

Ref: Tender No:

Dated:

Sub: Supply of two-dimensional gas chromatography (GCxGC) system with Mass spectrometer and Flame Ionization Detectors

Sir,

I have carefully gone through the Terms & Conditions contained in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I am an authorized signatory of my company and am, therefore, competent to make this declaration.

(Signature of the Bidder)

Name:

Designation, Seal

Date:

Annexure 5:

Details of items quoted:

- a. Company Name
- b. Product Name
- c. Part / Catalogue number
- d. Product description / main features
- e. Detailed technical specifications
- f. Remarks, if applicable

Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with technical bid.
3. Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.