



**INDIAN INSTITUTE OF TECHNOLOGY MADRAS**  
**Chennai 600 036**

Telephone: (044) 2257 4187  
E-mail: vinu@iitm.ac.in



Dr. R. Vinu  
Project Coordinator

Ref: CHE/RVIN/2020/001/IC  
Dated: 05.06.2020

Limited Tender No: CHE/RVIN/2020/001/IC

**Due Date: 29.06.2020, 3:00pm**

**Pre-Bid meeting: - Not required.**

**Technical Bid opening meeting on Due Date: 29.06.2020, 4:00pm**

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of “**Ion Chromatograph**” conforming to the specifications given in (**Annexure-I**).

**Terms and Conditions of Limited Tender**

- 1. Preparation of Bids:** - The Limited tenders should be submitted under **Two bid system** (i.e.) Technical- and -Financial bid.
- 2. Delivery of the tender:** - The tender shall be sent to the below-mentioned addresses either by post or by courier (duly sealed and super scribed on the envelope with the reference No and due date) so as to reach the following address before the due date and time specified in our Schedule:  
**Dr. R. Vinu,**  
**Department of Chemical Engineering**  
**IIT Madras**  
**Chennai - 600 036**
- 3. Price:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to **Department of Chemical Engineering**.
  - a. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for concessional GST and relevant certificate will be issued.
  - b. In case of import supply, the price should be quoted without custom duty. IIT Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty (not exceeding 5%) and the price should be quoted on EX-WORKS and CIP (stating the Cost, Insurance, Freight separately) and indicating the mode of shipment.
- 4. Terms of Delivery:** - The item should be supplied to our Departments as per Purchase Order. In case of import supply, the item should be delivered at the cost of the supplier to our Institution. The Installation/Commissioning should be completed as specified in our important conditions.
- 5. Catalogue:** Original catalogue (not any photocopy) of the quoted model duly signed must accompany the quotation in the Technical bid
- 6. Late offer:** - The offers received after the due date and time will not be considered
- 7. Payment:** - No Advance payment will be made for Indigenous purchase. However, 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved. In

case of import supplies the payment will be made only through 100% Letter of Credit i.e. (90% payment will be released against shipping documents and 10% after successful installation wherever the installation is being done).

8. **Advance Payment:** - No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Vendor has to submit a Bank Guarantee from a Nationalized Bank of India equal to the amount of advance payment.
9. **On-site Installation:** - The equipment or machinery has to be installed or commissioned by the successful bidder within number of days (as prescribed by PI's) from the date of receipt of the item at site of IIT Madras.
10. **Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment.
11. **Validity:** Validity of Quotation not less than 60 days from the due date of tender
12. **Technical Bid Opening:** The technical bid will be opened on **29.06.2020 4:00pm** at the Department of **Chemical Engineering**, IIT Madras and the **financial bids** of those tenders who are technically qualified will be opened at a **later date under intimation to them**.
13. **Performance Security:-**The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply within 21 days from the issue of work/purchase order. The Performance Security should be furnished in the form of an Account Payee DD / FD Receipt from the commercial bank (or) Bank Guarantee from any nationalized bank in India.
14. **Accept /Reject:** IIT Madras reserves the full right to accept / reject any tender at stage without assigning any reason.
15. **Settlement of Disputes:** 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 Chennai in Tamil Nadu.
16. **Risk Purchase Clause:** - In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
17. **Unsolicited offers:** "This notice is being published **for information only** and is not an open invitation to quote in this limited tender. Participation in this tender is by invitation only and is limited to the selected registered suppliers. Unsolicited offers are liable to be ignored. However, suppliers who desire to participate in such tenders in future may apply for registration as per procedure." The Website for Registration of vendors is <http://web.iitm.ac.in/supplier/> and the mail address for queries is "[workflow@rt.iitm.ac.in](mailto:workflow@rt.iitm.ac.in)".

Yours sincerely,

**Dr. R. Vinu,**  
**Department of Chemical Engineering**  
**IIT Madras**  
**Chennai - 600 036**

## **Technical Specification for Ion Chromatograph**

**Purpose:** Ion Chromatography (IC) system for identification and quantification of anions and cations dissolved in the aqueous phase from the exhaust of municipal solid waste, biomass and coal combustion, and in the aqueous phase from hydrothermal liquefaction of wastes. The aqueous phase might contain dissolved organic compounds at low concentrations (<1-2%).

**Anions:** fluoride, chloride, nitrate, nitrite, phosphate, sulphate, perchlorate, oxyhalides, organic anions like formate, acetate speciation of arsenic (arsenite and arsenate), selenium, chromium

**Cations:** sodium, ammonium, aliphatic amines, lithium, potassium, calcium, magnesium, barium, strontium, borate, silicate, aluminium, nickel, cobalt, copper, zinc, iron, manganese

**Detection method:** Conductivity detection for both anions and cations specified above. The conductivity detector should be microprocessor-based with a thermostated micro flow cell. Conductivity range: 0-15000  $\mu\text{S}/\text{cm}$  or more. Noise: < 0.1nS/cm at 1uS/cm level. The system should be capable of operating in the entire pH range (1-14).

**Pump:** Dual piston type high pressure pump with maximum flow rate of 10 mL/min with flow rate reproducibility of  $\pm 0.1\%$  and flow rate resolution of 0.001 mL. Upper limit on pressure should be 5000 psi or above.

**Injector:** 6-port injector valve with fast response time. Pump, injector and detector should be controlled through software. Autosampler: Quote separately.

**Columns:** IC columns for the analysis of the aforesaid anions and cations should be provided. The column use history and the no. of injections should be available in the software. Column housing should be provided. All the flow lines and associated fittings should be PEEK-based. Guard columns should be included.

**Software:** The instrument operation and control should be through the software interface. The software should be capable of data acquisition and processing. The software should be Windows-based. Laptop/PC should be included in the quote.

**Desired feature:** The system should have the facility to upgrade for electrochemical detector in future.

**Consumables:** Standard consumables like tubing, fittings, filter frits, solvent bottles, standards and reagents, and other accessories should be provided.

**Suppressor:** It should be of packed bed type with high loading and high back-pressure (at least 350psi or more) tolerance with continuous regeneration. The regeneration of the suppressor should be by external chemical regeneration mode with the possibility of controlling the regenerant flow rate. The suppressor should be 100% solvent – acetone, methanol & acetonitrile compatible.

**Warranty:** Minimum two years warranty with full technical support should be provided.

**Contact for technical enquiries:**

Dr. R. Vinu, Associate Professor,  
Chemical Engineering, IIT Madras, Chennai – 600036  
E-mail: [vinu@iitm.ac.in](mailto:vinu@iitm.ac.in)  
Phone: +91-9500158723