DEPARTMENT OF BIOCHEMICAL ENGINEERING AND BIOTECHNOLOGY

INDIAN INSTITUTE OF TECHNOLOGY DELHI

HAUZ KHAS, NEW DELHI – 110016

21.09.2013

Subject: Notice Inviting Quotation (NIQ) for purchase of Elemental (CHNSO) Analyser

Sealed quotations are invited for supply of **1 (one) Elemental (CHNSO) Analyser** in the DBEB, addressed to **Prof. T. R. Sreekrishnan, DBEB, IIT Delhi** on or before **14. 10. 2013 by 5.00 P.M.** All the interested parties are requested to read the specifications given below carefully before submitting the quote. The quotation must include all taxes, handling, shipping and installation charges. Also all details of guarantee/warranty should be clearly mentioned. The Technical and Financial bids should be in separate sealed envelopes and both should be placed inside a large sealed envelope inscribed with "**Quotation for purchase of Elemental (CHNSO) Analyser**". The Technical bid must provide all information about the components asked in the sections "Essential Technical Specification".

Item Name: **Elemental (CHNSO) Analyser**

Quantity: 01 (One)

NOTE: Kindly do not send any unnecessary documents, like advertisements containing the product range list of vendors/distributors etc., copies of recent PO's of supplies made by vendor, along with the bids.

Prof. T.R. Sreekrishnan

(DBEB, IIT Delhi)

ESSENTIAL TECHNICAL SPECIFICATIONS

1. Fully automated PC/microprocessor controlled simultaneous CHNS and O analyser with high sensitivity detector and capable for multiple operating modes (CHNS, CHN, CH, etc.) with sample (solids & liquids) size of 0.02 to 1000 mg with autosampler having sample (solid and liquid) holding capacity of 30 or more.
2. The instrument should be capable of analysing solid waste, sludge, hazardous waste, coal, coke, biomass, liquid waste, organic and inorganic and organometallic compounds and solids, liquid and liquid volatile samples.
3. Should have at least two furnaces with independent temperature control ≥ 1200 ^{o}C for each furnace. Combustion and reduction should be done with independent temperature control. Should have ease of replacement of combustion tube and GC column.
4. Should have mass flow controller/electronic flow controller for constant flow of carrier gas. Flow controller must be installed after the furnaces to control the gas flow to take care of combusted gases in the furnace. Should have features to minimize excess oxygen utilization.
5. Ash finger to hold ash and prevent ash from affecting catalyst and quartz combustion tube is preferable.
6. Instrument should have the analytical range 0 – 100% for all elements with the capability of measuring following absolute weight:
   Carbon (C) 0 – 30 mg or better
   Hydrogen (H) 0 – 2 mg or better
   Nitrogen (N) 0 – 10 mg or better
   Sulphur (S) 0 – 5 mg or better
   Oxygen (O) 0 – 5 mg or better
7. Minimum detection limit should be ≤100 ppm for all analytes (C, H, N, S and O) with an accuracy of ≤0.3 % of absolute or better for all elements.
8. Should be equipped with mass flow controller and electronic flow sensors for accurate readout and control of flow and display.
9. Analysis time: Self optimizing depending on element content and weight, but less than 15 minutes in any case.
10. Separation system should be based on adsorption desorption principle for separation of gases using chromatography columns with appropriate temperature control.
11. Detector system should have temperature stabilized TCD detector or NDIR detector for measurement of C-H-N-S and O and IR Detector for trace measurement of sulphur as low as 50 ppm.
12. Instrument should have facility to auto save data during power failure.

13. Instrument should be operated with Helium/Argon as carrier gas. It should have Microprocessor control for gas flow control. Separate mass flow controller (MFC) for carrier gas (He) and oxygen (O2), Temperature controlled MFC operation is desired.
14. Consumables must be quoted for 2000 samples for CHNS and 2000 samples for oxygen for each of liquid and solid samples.
15. Should be supplied with required accessories for solid, liquid, volatile solid and volatile liquid sample packing.
16. Should be supplied with liquid sample sealing press for packing and analysis of liquid samples and volatile samples separately.
17. Adequate amount of necessary standard samples should be provided along with the instrument for regular calibration.
18. Micro balance of 0.001 mg accuracy or better. Should have automatic weight entry facility in the CHNSO analyser.
19. Two pairs of carrier (≥99.995 % mol purity He/Ar), combustion (≥99.995 % mol purity O_2), pyrolytic and pneumatic (99.95 % mol purity N_2) gas cylinders with double stage stainless steel (not chrome plated) diaphragm regulators with all connection tubing to the instruments.
20. Branded iso-9000 certified computer with B/W laser printer.
21. 3 KVA UPS with 30 mins back up for running the instrument in active mode.
22. The quotation should include the details of service back up (manpower and technical facility) in Delhi for maintenance of the instrument.
23. Windows OS compatible application software should have following features:

    Essential:

    a. Facility with multiwindows for displaying method, sample and analysis status.
    b. Display of set and actual pressure, flow rate, temperature, no. of sample analyzed.
    c. Should have segmented leak check through software.
    d. Auto leak failure or electronic failure detection.
    e. Calculation of data and report formatting.

    Optional:

    f. Provision for setting maintenance interval with warning regarding maintenance needed.
    g. Online display of graphics and text data.
    h. Instrument control reintegration / report, calibration, automatic data acquisition and processing.
24. Comprehensive warranty with spares for 3 years from the date of installation of the instrument.

25. Comprehensive on-site training to the users after installation.
26. Catalogue in original with all technical specifications printed on the catalogue. Principal needs to declare the year of launch of the quoted model.

NECESSARY TERMS AND CONDITIONS

1. IIT Delhi is exempted from paying custom duty under notification No.51/96 (partially or fully) and necessary "Custom Duty Exemption Certificate" can be issued after providing following information.
    a. Shipping details i.e. Master Airway Bill No. and House Airway No. (if exists)
    b. Forwarder details i.e. Name, Contact No., etc.

    Custom Duty Exemption Certificate will be issued to the shipment in the name of the Institute and Bills of Entry should be submitted to IIT Delhi later on.

2. Either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender. If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.

3. If the bidder is an authorized dealer of any manufacturer, the authorized Indian dealership certificate from the principles should be enclosed. Similarly, proprietary certificate for proprietary items should be provided.

4. IIT Delhi is exempted from paying Excise Duty and necessary Excise Duty Exemption Certificate will be provided for which following information are required. a. Quotation with details of Basic Price, Rate & Amount on which ED is applicable.

5. Please quote prices of imported items at FOB (Freight on Board) IIT Delhi inclusive of all taxes, freight, delivery, installation and onsite training charges. The quotation should provide the total price of the system including all taxes and transportation charges.

6. In case IIT Delhi is imposed with demurrage charge due to import on CIF, the entire demurrage charge has to be borne by the Indian Agent of foreign supplier.

7. A special discount/rebate wherever admissible keeping in view that supplies are being made for educational purpose in respect of public institution of national importance may please be indicated.

8. Payment Options (any one to be chosen by the Department)
    - Letter of Credit: 90% payment against shipping documents & balance 10% after satisfactory installation. For large purchase i.e. costing over Rs. 1 crore, 100% payment be made through LC.
    - Sight Draft: Payment against documents through bank.
    - Against Delivery: Payment by wire transfer after receipt of material.
    - Advance payment: pre-payment by wire transfer (for orders less than Rs. 5 lakh)
    - Against Delivery: Payment by wire transfer after receipt and installation of material.

9. Delivery period: within 1 month from the issue of supply order.

10. Warranty: at least 3 years comprehensive onsite warranty should be provided. AMC price beyond 3 years should be mentioned separately.

11. The quotations must have validity of at least three months.

12. Authority of IIT Delhi reserves the right to reject any or all quotations without assigning any reasons.