


	<p style="text-align: center;">INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036</p> <p>Telephone : [044] 2257 9798/9760 FAX : [044] 22570545/8366 E-mail: arpp@iitm.ac.in</p>	
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V. Sathyanarayanan
Senior Manager (Project Purchase)

Ref: PHY/SUDA/016/2017
Date: 07.07. 2017

Open Tender No: PHY/SUDA/016/2017

Due Date: 28.07.2017, at 2.00 pm

Pre-Bid meeting: - The bidders are requested to attend the pre-Bid meeting scheduled on 21.07.2017 at 3 pm Conference room, Department of Physics Engineering, IIT Madras.

Technical Bid opening meeting on 28.07.2017 at 3.30 p.m.

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of

Equipment: "ELECTROCHEMICAL WORKSTATION" (PHY/SUDA/016/2017)

conforming to the specifications given in Annexure.

A Vendor who can supply and integrate the above three equipment alone need to respond to the tender please.

Instructions to the Bidder

- (i) **Preparation of Bids:** - The tenders should be submitted under two-bid system (i.e.) Technical bid and Financial bid.
- (ii) **Delivery of the tender:** - The tender shall be sent to the below-mentioned addresses either by post or by courier so as to reach our office before the due date and time specified in our Schedule. The offer/bid can also be dropped in the tender box on or before the due date and time specified in the schedule. The tender box is kept in the office of the

**Senior Manager,
Project Purchase
IC & SR Building 2nd floor,
I.I.T. Madras, Chennai – 600 036.**

(iii) **Pre-Bid meeting:** - The bidders are requested to attend the pre-Bid meeting scheduled on **21.07.2017 at 3 pm** Conference room, Department of Physics Engineering, IIT Madras.

(iv) **Opening of the tender:** - The offer/Bids will be opened by a committee duly constituted for this purpose. The technical bids will be opened first and it will be examined by a technical committee which will decide the suitability of the bid as per our specifications and requirements. The bidders will be invited for opening of Technical bids. In respect of opening of financial bid, those bidders who are technically qualified only will be called for.

(v) **Prices:** - The price should be quoted in nett per unit (after breakup) and must include all packing and delivery charges to various Departments/Centres/Institutions. The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. However the percentage of tax & duties should be clearly indicated.

The price should be quoted without custom duty and excise duty, since I.I.T. Madras is exempt from payment of excise duty, and the custom duty will be paid at concessional rate against duty exemption certificate.

In case of import supply, the price should be quoted on EX-WORKS and CIP basis indicating the mode of shipment.

(vi) **Agency Commission:** - Agency commission, if any, will be paid to the Indian agents in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in Tender even in the case of 'Nil' commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent. The foreign Principal should indicate about the percentage of payment and it should be included in the originally quoted basic price, if any.

(vii) **Terms of Delivery:** - The item should be supplied to the Departments of Ocean Engineering 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.

(viii) **Technical Bid Opening:** The technical bid will be opened on 28.07.2017 at 3.30 p.m at the Conference room, Department of Physics 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.

(ix) IIT Madras reserves the full right to accept / reject any tender at stage without assigning any reason.

Yours sincerely,



V. Sathyanarayanan
Senior Manager (Project Purchase)
IC&SR Building, I.I.T. Madras,
Chennai – 600 036

वि. सत्यनारायणन

V. SATHYANARAYANAN

वरिष्ठ प्रबन्धक (परियोजना क्रय)

SENIOR MANAGER (PROJECT PURCHASE)

आईसी एवं एसआर केन्द्र / Centre for IC & SR

आईआईटी मद्रास / I.I.T. MADRAS-600036

SCHEDULE

Important Conditions of the tender

1. The due date for the submission of the tender is **28.07.2017, 2.00 pm.**

The offers / bids should be submitted in two bids systems (i.e.) Technical bid and Financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes, transportation, packing & forwarding, installation, guarantee, payment terms, pricing terms etc. The Technical bid and Financial bid should be put in separate covers and sealed. Both the sealed covers should be put in a bigger cover. The Open Tender for supply of **“Equipment: ELECTROCHEMICAL WORKSTATION”** should be written on the left side of the Outer bigger cover and sealed.

2. **EMD: - EMD should be at 2% (two percent) of the tender value quoted by the bidder.** The EMD should be included in the Financial bid which will not be opened for Technical evaluation. Enclosing the EMD in the Technical bid will automatically disqualify the tenderer. EMD should be in the form of DD in favour of “The Registrar, Indian Institute of Technology Madras” and payable at Chennai. The tender without EMD would be considered as UNRESPONSIVE and REJECTED. Photo/FAX copies of the Demand Draft/Banker’s pay orders will not be accepted. No interest will be paid for the EMD and the EMD (Bid Security) will be refunded to the successful bidder on receipt of Performance Security.
3. **Performance Security:-** The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD, FD Receipt from the commercial bank, Bank Guarantee from any nationalized bank of India will be ~~an~~ acceptable.

Only after submission of Performance Security, Purchase Order/Work Order will be released / L.C will be opened.

Performance Security in the form of Bank Guarantee:- In case the successful bidder wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed through the Beneficiary Bank to the end user bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee from a Nationalized Bank of India.

The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.

4. If an Indian agent is involved, the following documents must be enclosed:
Foreign principal's proforma invoice indicating the commission payable to the Indian Agent and nature of after-sales service to be rendered by the Indian Agent.
 - ✓ Copy of the agency agreement with the foreign principal and the precise relationship between them and their mutual interest in the business.
 - ✓ The enlistment of the Indian agent with Director General of Supplies & Disposals under the Compulsory Registration Scheme of Ministry of Finance.
5. The offer/bids should be sent only for a machine that is available in the market and supplied to a number of customers. A list of customers in India and abroad with details must accompany the quotations. Quotations for a prototype machine will not be accepted.
6. Original catalogue (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid. No prices should ever be included in the Technical bid.
7. Documentary proof for the claimed position and reputation accuracies must be obtained from the principals and submitted along with the relevant pages of the standards.
8. Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal.
9. **Validity:** Validity of Quotation not less than 90 days from the due date of tender.
10. **Delivery Schedule:-** The tenderer should indicate clearly the time required for delivery of the item. In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.
11. **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.
12. **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).

13. **Advance Payment:-** No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Foreign Vendor has to submit a Bank Guarantee equal to the amount of advance payment and it should be routed through the Beneficiary Bank to the end user Bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee through a Nationalized Bank of India.
14. **On-site Installation:** - The equipment or machinery has to be installed or commissioned by the successful bidder within 15 to 20 days from the date of receipt of the item at site of IIT Madras.
15. **Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment. Any extended warranty offered for the same has to be mentioned separately. (for more details please refer our Technical Specifications).
16. **Late offer:** - The offers received after the due date and time will not be considered. The Institute shall not be responsible for the late receipt of Tender on account of Postal, Courier or any other delay.
17. **Acceptance and Rejection:** - I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.
18. **Do not quote the optional items or additional items unless otherwise mentioned in the Tender documents / Specifications.**
19. **Disputes and Jurisdiction:** -
 - a. **Settlement of Disputes:** Any dispute, controversy or claim arising out of or in connection with this PO including any question regarding its existence, validity, breach or termination, shall in the first instance be attempted to be resolved amicably by both the Parties. If attempts for such amicable resolution fails or no decision is reached within 30 days whichever is earlier, then such disputes shall be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996. Unless the Parties agree on a sole arbitrator, within 30 days from the receipt of a written request by one Party from the other Party to so agree, the arbitral panel shall comprise of three arbitrators. In that event, the supplier will nominate one arbitrator and the Project Coordinator of IITM shall nominate one arbitrator. The Dean IC&SR will nominate the Presiding Arbitrator of the arbitral tribunal. The arbitration proceeding shall be carried out in English language. The cost of arbitration and fees of the arbitrator(s) shall be shared equally by the Parties. The seat of arbitration shall be at IC&SR IIT Madras, Chennai.

b. **The Applicable Law:** This Purchase Order shall be construed, Interpreted and governed by the Laws of India, Court at Chennai shall have exclusive jurisdiction subject to the arbitration clause.

20. All Amendments, time extension, clarifications etc., will be uploaded on the website only and will not be published in newspapers. Bidders should regularly visit the above website to keep themselves updated. No extension in the bid due date/ time shall be considered on account of delay in receipt of any document by mail.

Acknowledgement:- It is hereby acknowledged that the tenderer has gone through all the conditions mentioned above and agrees to abide by them.

**SIGNATURE OF TENDERER
ALONG WITH SEAL OF THE
COMPANY WITH DATE**

Specification for ELECTROCHEMICAL WORKSTATION

Tenders are invited for the purchase of equipment "Multichannel Electrochemical Workstation". The following vendor eligibility criteria apply.

1. The vendor must be an Original Equipment Manufacturer (OEM). Authorized dealer/partner of OEM can also participate in the tender (relevant document in this regard to be attached).
2. The tenderer should have service providing facilities in India.
3. The quotation should be sent in a two-bid cover (technical bid and price bid)
4. All the mandatory and optional items should be compatible with the proposed model.

Technical specifications for equipment (i) Multichannel Electrochemical Workstation

Quotations for the Multichannel Electrochemical Workstation (potentiostat & galvanostat) should be submitted separately. Total number of channels required is Eight (8).

The detailed specifications required for the channels are given below. The list provided below is the essential specifications for the potentiostat/galvanostat. Please provide technical bid and price bid separately. Also include the compliance statement.

Multichannel Electrochemical Workstation should have following specifications:

Channel 1 to 5 specifications:

- 1) Working current range for 5 channels should be ± 20 nA to ± 500 mA with resolution of 1 picoampere.
- 2) Compliance voltage should be ± 12 V; applied voltage range should be ± 10 V with a voltage accuracy of 1 mV or better, and a voltage resolution of 1 microvolt or better.
- 3) All the channels should have impedance measurement capability in the frequency range of 10 μ Hz - 7MHz or more, with AC amplitude of 0.5mV to 2V with single/multisine modes.
- 4) Acquisition speed of system should be 8,00,000 samples/second or more; Bandwidth of the potentiostat should be equal or better than frequency range (8 MHz or more).
- 5) All channels should support floating facility and usable in 2, 3, 4 and 5 electrode configuration.

- 6) All channels should work independently and simultaneously and also in bi-potentiostatic mode of operation.

Channel 6 to 8 specifications:

- 1) Working current range for 3 channels should be $\pm 10 \mu\text{A}$ to $\pm 400 \text{ mA}$ with a resolution of 800 picoampere or better.
- 2) Compliance voltage should be $\pm 20 \text{ V}$ or more; applied voltage range should be $\pm 10 \text{ V}$ with a voltage resolution of ~ 5 microvolt or better.
- 3) At least two channels should have impedance measurement capability in the frequency range of $10 \mu\text{Hz}$ - 1 MHz or more, with AC amplitude of 0.5 mV to 2 V with single/multisine modes.
- 4) Acquisition speed of system should be 2,00,000 samples/second or more; Bandwidth of the potentiostat should be equal or better than frequency range 1 MHz or more.
- 5) All channels should support floating facility and usable in 2, 3, 4 and 5 electrode configuration.
- 6) All channels should work independently and simultaneously and also in bi-potentiostatic mode of operation.

Current and voltage booster specifications:

- 1) System should be able to apply and measure $\pm 25 \text{ V}$ with booster
- 2) System should be able to measure maximum of 2 A current when cell voltage is $\pm 25 \text{ V}$
- 3) This range should work either in series or in parallel connection
- 4) Booster must have very low rise and fall time, less than 300 nanoseconds for the precise measurement.

The workstation should have the ability to interface with computer with appropriate software.

Software provided should be capable of the following functions:-

- a. Complete battery /Super capacitor testing software with analysis for Charge / discharge cycle controlled with voltage / current / time / power / resistance.
- b. Various C-rate applied in single cycle.
- c. EIS measurement and analysis should be done in both potentiostatic and galvanostatic techniques.
- d. Recording of additional analogue voltage input from external sensors.
- e. Columbic Efficiency factor determination facility.
- f. Software should be synchronized to control external devices like thermal chambers or controlled atmosphere chambers.

- g. Tools required to study structural transformations in the electrode material and degradation mechanisms occurring in battery components (electrodes/electrolyte).
- h. Columbic efficiency determination facility is required to estimate the lifetime of a battery.
- i. Facility required to study the phase transformations during the use of the battery.
- j. Software facility required to predict the lifetime of battery.
- k. X co-efficient (fraction of Li ion intercalation) determination facility should be provided.
- l. Voltammetry software including Cyclic Voltammetry, linear sweep voltammetry, Chronoamperometry, CC, Chronopotentiometry, AC Voltammetry.
- m. Fuel cell/photovoltaic testing software with a capability to measure and calculate fuel cell/photovoltaic parameters including constant voltage, constant current, constant power, I-V with P_{max} , P_{min} , fill factor, efficiency. The software should also be capable of measuring open circuit voltage decay for photovoltaic devices.
- n. Pulse software including DPV, NPV, RNPV, SWV etc.
- o. Corrosion software should measure and calculate E_{corr} vs Time (EVT), Linear Polarization (LP), Generalized Corrosion (GC), Cyclic Potentiodynamic Polarization (CPP), Potentiodynamic Pitting (PDP), Multielectrode Potentiodynamic Pitting (MPP), Potentiostatic Pitting (PSP), Multielectrode Potentiostatic Pitting (MPSP), Critical Pitting Temperature (CPT)
- p. Impedance Spectroscopy software including PEIS, GEIS with single sine and Multisine techniques are required. Equivalent fitting circuit with license key should be included.
- q. Facility to test stack & cell parameters simultaneously is preferred.

One desktop computer should be provided (configuration: i7/4GB/500 GB/Windows7 or later version of OS)

Battery holder 2 numbers (for holding minimum of 8 cells) are required. Battery holder should be able to test cylindrical and coin cell batteries. Standard data sheet for the same is required.

Warranty: At least 2 Years of comprehensive warranty and 1 year of non-comprehensive warranty should be provided.

Optional accessories:

- a) Any standard electrode (like Ag/AgCl or SCE)
- b) Platinum working electrode or platinum counter electrode.
- c) Calomel reference electrode or Non aqueous reference electrode

Terms and conditions

1. Vendors must submit a comprehensive compliance statement in a table format for the tender specifications along with the offer.
2. The bidders should have supplied at least 20 or more such units in IITs / National Labs / Universities in India during the last three years. Submit relevant documents.
3. Should have service providing facilities in India.
5. On-site training for the operation, calibration, service and troubleshooting support should be provided

Guarantee, warranty, support and service

- Three years warranty, on all parts and labor, from the date of commissioning and acceptance test on site, free software upgradation for the life time of equipment, availability of technical personnel/application scientist and service in India within 48 hours of intimation.
- Instrument should be upgradable to newer versions of the software and hardware as and when required.