

**INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE  
Jadavpur, Kolkata 700 032**

**Tender No.: IACS/BC/PKD/DST/2012-13**

**Date: 23.05.2012**

**Sub: Dynamic Rotational & Oscillatory Research Grade Rheology Instrument with  
Peltier temperature Controller**

**Sealed tender** in two bids system (**Technical Bid & Financial bid**) is invited from bonafide, resourceful and eligible manufacturers/exclusive distributors of **Dynamic Rotational & Oscillatory Research Grade Rheology Instrument with Peltier temperature Controller** and following accessories by **22<sup>nd</sup> June, 2012 up to 1.00 P.M** and will be opened on **25<sup>th</sup> June, 2012 at 3.00 PM** in the S. N. Bose Hall of Indian Association for the Cultivation of Science, Jadavpur, Kolkata -700032. Manufacturers/ exclusive distributors should have past history of supplying this type of instrument to this or other Scientific Organizations.

**Tender Form:** Tender should be submitted in plain paper or Letter Head separately in the forms of Technical and price Bids both enclosed in a single envelop.

**A). TECHNICAL BID:**

“Technical Specifications: **Dynamic Rotational & Oscillatory Research Grade Rheology Instrument with Peltier temperature Controller** with following Hardware/Software:

A research grade rheometer is required for studying non-Newtonian flows, low viscosity structured fluids and thixotropic materials. The instrument should have digital interface for control, display, record of parameters and real time sensor data.

Modes of operation: Oscillatory: Stress/strain sweep at fixed frequency, frequency sweep at fixed strain/stress, temperature sweep at fixed stress/frequency, superimposed stress/strain oscillation and steady shear, multiple frequency modes.

Steady shear/Flow mode: Controlled stress/strain sweeps, temperature sweep at constant stress/shear, squeeze flow and pull off. Creep mode and stress relaxation mode are desirable.

**Motor Technology:**

Air-bearing- supported Synchronous motor (or Brushless DC motor) for precision dynamics. Motor torque output should not change with temperature with no motor heating. Motor torque should be proportional to motor current. Dual Air bearing technology - with a radial and axial air bearing supporting the motor. The Transducer can be combined or separate.

- |                    |                                  |
|--------------------|----------------------------------|
| 1. Bearing Type:   | Air                              |
| 2. Motor:          | Synchronous motor (Brushless DC) |
| 3. Maximum torque: | 200 mNm                          |

- 4. Minimum torque, rotation: Preferably 10 nNm  
(CR mode Steady)
- 5. Minimum torque, oscillation: 2-10 nNm  
(CS mode)
- 6. Torque resolution: Preferably <1.0 nNm

**Motor Dynamics:** It should have a Sample-adaptive Shear-rate controller; real-time position control for performing strain-controlled oscillatory tests; Digital Current sources integrated with high-speed digital signal processing to perform measurements.

- 7. Minimum angular frequency:  $1 \times 10^{-7}$  rad/s
- 8. Maximum angular frequency: 628 rad/s
- 9. Angular velocity range:  $10^{-9}$ -314 rad/s  
(rotational speed)

**Motor Measurements:**

- 10. Normal force range: 0.001-50 N
- 11. Normal force resolution: 0.001 N or less
- 12. Step time, rate (Change in velocity): 5 ms
- 13. Step time, strain: 10 ms
- 14. Displacement control/Sensing: Optical Encoder
- 15. Displacement resolution: 10 nrad
- 16. Auto gap set: Description on the mechanism and motor speed are required
- 18. Peltier system: The system should be offered with built in Peltier System with a Temperature Range from -40 °C to 200 °C with Auto-recognition.
- 19. Accessories for Peltier: It should be provided along with an effective Counter-cooling circulation system and an efficient Hood to prevent solvent evaporation
- 20. Measuring systems: Cone Plate (1°, 2° of 25 mm and higher with 50 mm plate)  
Parallel Plate (50 mm or higher)  
Concentric cylinder
- 21. Air Compressor: (i) Compact Oil free Air Compressor necessary for the Rheometer with tubing and connector  
  
(ii) Air purification membrane Air Dryer/filter to separate oil, particle and condensate

22. Associate parts: Essential various associated parts for Rheological experiments. Accessories, spares and optional components (to be quoted separately, if not part of the standard configuration): (i) Additional sensors (cylindrical, immersion, special geometries etc.) (ii) Instruments and data analysis software and support (iii) Accessories such as pumps, cooling requirements etc. (v) Standard liquids, sample holders etc. (iv) Any other items needed for a self-contained installation of the unit. Power supply: The main unit, accessories, cables and connectors should conform to the Indian specifications. Warranty: 1 year comprehensive, on-site warranty.
23. Software: The system should be offered with user friendly software to perform experiments, measurement and analysis including: integrated modelling/curve fitting, inter-rheological conversion, data reduction and handling protocols with special optional modules like master curve, intrinsic viscosity module, spectrum relaxation/retardation, molar mass distribution, squeeze flow rheology and extensional rheology modules, rotational with control stress/combination of csr+css, oscillatory with true strain/direct strain amplitude/control stress/combination of strain+css transient with creep(single/multi-level)/step-strain(stress relaxation) combination with any modes above – for e.g. transient+rotational or oscillatory+rotational
24. Additional features: A modular design with scope for various attachments for structural analysis of materials under shear would be highly preferred. Arrangement for visualization of sample microstructure at 20-50 x magnification or more during flow or deformation with necessary hardware, software and temperature controller may be quoted.

Any other additional features in favour of your instrument with technical compliance data originally signed should be included along with quotation.

25. The system should be offered with suitable & branded windows operating system based PC workstation with following essential accessories/items:

(i) Computer [2GB RAM, more than 200 GB Hard Disk, 17" monitor (LCD), Combo drive, Key board, optical mouse, Windows XP or higher version OS] and appropriate online UPS (APC/Powerone make) with 30 minutes back-up.

**Installation/Demonstration /Application Training at site: Free of cost by the supplier**

**Warranty: Minimum 1 year**

**User list:** The supplier should provide a list of current users (with contact no, Email address etc) for the quoted item in India.

**Service facility:** Supplier should mention their details of service setup and Manpower in Kolkata who are responsible for after sales support. Response time should be within 24 hours

Abovementioned specifications are general in nature and widely known to the concerned manufacturers/ industries.

## **B). FINANCIAL BID:**

1. The financial bid should be super scribed as “**Finance Bid**” on the outer cover of the envelope.
2. **Bid Security (EMD):** An Account Payee Demand Draft of **Rs. 1,00,000/-** (Rupees One lakh) in the name of “**Indian Association for the Cultivation of Science**” is to be furnished by the bidders except those who are registered with the Central Purchase Organizations, National Small Industries Corporation or the concerned Ministry or Department, as Bid Security money or Earnest Money Deposit (EMD). The bid security may also be accepted in the form of Bank Guarantee from any of the commercial banks in an acceptable form.
3. The Demand Draft for the Bid-Security money should have at least 45 (forty five) days validity period after the opening of the Bids.
4. In case of non-award of the work the Bid Security money would be returned to the unsuccessful Bidders.
5. **Performance Security:** An Account Payee Demand Draft of **Rs. 2,00,000/-** (Rupees Two lakhs) in the name of “**Indian Association for the Cultivation of Science**” is to be furnished by the successful bidder as Performance security money. Performance security money should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. Bid security money will be refunded to successful bidder on receipt of Performance security money.

## **C) GENERAL INSTURCTIONS:**

1. There should be two separate envelopes duly sealed for two bids and should be super scribed with (a) Technical Bid, and (b) Financial Bid and both these sealed envelopes are to be put in a bigger envelope which should also be sealed.
2. Tender Notice Number and tender for “**Dynamic Rotational & Oscillatory Research Grade Rheology Instrument with Peltier temperature Controller** ” should clearly be written on the envelope.
3. At any time prior to the bid due date, IACS may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder during pre-bid meeting, modify the bidding documents. The amendment(s) will be notified on the Institute website. Prospective bidders are advised to occasionally visit the website for any amendment.
4. The tender submitted shall remain valid at least for four months from the date of opening the tender. Validity beyond four months from the date of opening of the tender shall be by mutual consent
5. The tender should be sent/submitted to the following address by **1.00 p.m** on **22<sup>nd</sup> June, 2012:**

### **Prof. Prasanta K Das**

Department of Biological Chemistry  
Indian Association for the Cultivation of Science,  
2A & B Raja S. C. Mullick Road, Jadavpur,  
Kolkata-700032

6. Authorized Dealership Certificate should be submitted in case of principal manufacturing company is not quoting directly.

7. Technical bids will be opened first to evaluate technical specifications of the equipment and thereafter the price bids of only the technically qualified distributor/vendors will be opened.

8. **Pre-bid Meeting:** Pre-bid meeting will be held on **11<sup>th</sup> June, 2012 at 12.00 Noon** in the S. N. Bose Hall of Indian Association for the Cultivation of Science, Jadavpur, Kolkata -700032. Prospective bidders may attend the meeting to clarify technical specification and others if any.

9. **Last date for submission** of the tender: **22<sup>nd</sup> June, 2012 up to 1.00 PM** in the office of the Biological Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Kolkata -700032.

10. **Opening of Technical Bids:** Technical Bids will be opened on **25<sup>th</sup> June, 2012 at 3.00 PM** in the presence of intending bidders or their representatives in the S. N. Bose Hall of Indian Association for the Cultivation of Science, Jadavpur, Kolkata -700032.

11. **Opening of Price-Bids:** The Price Bids of the bidders qualifying the technical bid will only be opened. Date, time and venue will be informed to the successful bidders. The rest of the bids will be rejected.

12. Payment: 100% through Letter of Credit. The rate should be inclusive of all taxes, transportation etc. Nothing extra will be paid in addition to the quoted rate. Both the CIP and FOB rate should be provided.

13. The model number, make, and a printed literature of the product should be submitted. Proposed delivery schedule should be mentioned clearly.

Please note that IACS will not provide any accommodation or expenses to any of the bidders for attending opening of technical bid/price bid

14. Incomplete tenders will be summarily rejected.

15. For any clarification regarding technical specifications, etc. please send your queries to "**Prof. Prasanta K Das**" <[bcpkd@iacs.res.in](mailto:bcpkd@iacs.res.in)>

16. In the event of date being declared a closed holiday for purchaser's office, the due date for submission of bids and opening of technical bids will be the following working day at the appointed time.

17. **Acceptance of Tender:** IACS authority does not bind itself to accept the lowest tender and reserves the right to reject any or all the tenders received without assigning any reason thereof.

Registrar