

**Open Tender Notification for the procurement of
“Rheometer”**

at the Indian Institute of Science, Bangalore

(Last date of submission of tenders: 06-May-2021)

Date: 02.04.2021

Dear Sir/Madam:

Please send your quotation valid for **120 days** for the supply of equipment described below. Your quotation should clearly indicate the terms and conditions of the quotations, delivery, delivery schedule, entry tax, payment terms, warranty coverage etc.

Important dates

Sl no	Description	Date
1.	Last date for submission of two-bid tenders. The tenderer should submit Technical and Financial Bid separately in sealed envelope super scribing the envelope as ‘ Technical Bid ’ and ‘ Financial Bid ’. Both these envelopes should again be put in a single envelope superscribed “ TENDER FOR RHEOMETER ” be addressed to; The Chair, Department of Mechanical Engineering, Indian Institute of Science, Bengaluru 560 012 within the due date.	06-May-2021
2.	Technical Bid opening date. The Financial bids of the short-listed agencies, qualifying in the technical scrutiny of the Committee set up by the Institute, will be opened at a later date and qualifying bidders will be intimated to attend the price bid opening.	Vendor(s) will be notified by email
3.	Validity of the quote	120 days

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IISc's REQUIREMENT

Rheometer for measuring the three components of the resultant force vector and the three components of the resultant moment vector.

TECHNICAL SPECIFICATION

Description	Technical Aspect
Measuring head type	The motor should adhere to following specification: 1. Linear relationship between torque and driving current. 2. Less jitter.
Basic measurement modes	1. Controlled strain 2. Controlled stress
Minimum torque	1 nN.m or better (rotation); 0.5 nN.m or better (oscillation)
Maximum torque	220 mN.m or better
Torque resolution	0.05 nN.m
Motor bearings	Dual air bearings both in axial & radial direction
Speed range	10^{-8} (or less) to 314 rad/s
Motor control	Digital current source with high-speed digital signal processing
Angular frequency range	10^{-7} or less to 314 rad/s
Strain sensors	High resolution optical encoders
Measurement types	Rotational, oscillatory, direct strain amplitude and control stress oscillation, and transient (creep and relaxation), tack/squeeze.
Normal force	0.005 to 50 N or better, resolution 0.5 mN or better
Gap control (standard)	Automatic gap compensation
Sample loading	Automatic gap compensation
Sample loading	Automated electronic trim lock during sample loading and sample trimming
Pc interfaces	Direct USB interface, ethernet and serial interface
Temperature control device	Peltier based temperature control, ranges from 5 to 180 °C or better
Following measuring geometries shall be provided for biological samples, it should be cleanable and detachable for cleaning purpose and cleaning will be	

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performed through autoclave / bleaching to remove bacteria and other inclusions or any foreign particles.	
Parallel plate geometries	Diameter: 25 mm & 50 mm (disposables & stainless steels)
Cone plate geometries	Diameter: 50 mm with 1 deg. Angle
Utilities	
Air compressor	100psi, 3.5 CFM oil free or better
Air dryer	Multistage membrane type including filter unit (microfilter) for removal of oil, particles and condensate.
Rheology software	
Analysis modules	Integrated modelling/curve fitting, rheo-optics adapter module, squeeze flow rheology and extensional rheology modules.
Testing protocols	<p>Rotational with rate/control stress/combination of Controlled Shear Rate (CSR)+ Controlled Shear Stress (CSS), Oscillatory with strain / direct strain amplitude / control stress / combination of strain+CSS.</p> <p>Transient with creep(single/multi-level)/step-strain (stress relaxation) Combination with any modes above – e.g., transient+rotational or oscillatory+rotational.</p> <p>Elastic (G'), loss (G''), complex modulus (G^*), $\tan \delta$ as a function of time, temperature, frequency, strain and stress in shear mode.</p> <p>Complex viscosity as a function of time, temperature, frequency, strain and stress.</p>
Super-imposed testing	Steady shear over oscillatory simultaneous operation
Upgradability	The rheometer should be readily upgradable to the following and the same should be confirmed on

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	<p>manufacturer's website/catalogue with following specifications:</p> <ol style="list-style-type: none">1. Second motor with axial force for DMTA applications in 3-point bending /dual cantilever & single cantilever modes and other compatible attachments Maximum force: 35 N or higher Maximum displacement: 9000μm or better Maximum frequency : 100 Hz or higher2. Thermo-mechanical analysis (TMA) with an additional lower motor.3. Microscopy attachment with polarizer and/or fluorescence filters and second rotational measuring drive allowing to visually monitor the stagnation plane of a sample in radial direction or with the help of a deflection mirror and a lower glass in axial direction while counter-rotation test is performed.4. High temperature controls up to 600 °C for molten salts and metals.
Lab demonstration	Viscosity measurement of water must be demonstrated. Rheometry of one biological fluid (to be chosen later) should also be demonstrated.

Training, Warranty and AMC

1. On-site installation and training
2. Minimum 2 years warranty
3. Minimum 3 years AMC

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Terms and Conditions

1. The quotations should be submitted in two bids system; i.e., Technical bid, and Commercial bid.
 - a. The technical bid must include all details of technical specifications of the instrument along with commercial terms and conditions masking only the price component. Bill of materials, brochures, technical datasheets, and any other document may be enclosed to help the evaluation of the technical bid. Please also include warranty terms and any other information on upgradation terms in the technical bid.
 - b. The commercial bid must include the price of the instrument in Indian currency indicating break up of:
 1. For goods: i. the quotations should be on FOR-IISc Bangalore basis in INR only.
 2. Installation, commissioning and training charges, including any incidental expenses, if any
 3. Agency commission charges, if any
 4. Price of every line item in the commercial bid should be quoted along with the total quoted price for the instrument to be operational (fixed and ready to use) in our facility c) Both the Technical and Commercial bid should be put in separate sealed envelopes and put together in another cover stating “**TENDER FOR RHEOMETER**” and should reach us on or before 17:00 hours 06-May-2021.
2. The vendor should have a good track record of having previously supplied similar equipment to Government funded reputed institutions in India. Provide evidence of at least three such purchase orders.
3. Full technical specifications and all relevant data sheets must be provided with Technical tender. Technical tender should also have a technical specifications compliance sheet.
4. Indian OEM or its authorized Indian distributor agency should have established office in India. If agency is quoting on behalf of OEM, then OEM should provide letter about the kind of relationship with the Indian agency.
5. Payment terms are negotiable.
6. The lead time for the delivery of the equipment should not be more than 3 months from the date of receipt of purchase order
7. The validity period of the quotation should be 120 days.
8. If the goods are found to be defective, they have to be replaced or rectified at the cost of the supplier within 15 days from the date of receipt

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of written communication from IISc. If there is any delay in replacement or rectification, the warranty period should be correspondingly extended. In such cases, all related costs must be borne by the supplier.

9. The purchaser reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time period without thereby incurring any liability of the affected bidder or bidders.
10. Vendors should be registered with PF, ESI, GST, MSME and other govt establishment as per Govt rules and regulation and Industrial workplace safety regulation. Copy of the same should be attached with tender.
11. Vendor must provide laboratory demonstrations of Rheometry results with fluids such as water and polymeric solutions.

SPECIFIC TERMS AND CONDITIONS

The following requirements should be specifically adhered to by the vendor, and express indication should be given regarding adherence.

1. **GUARANTEE PERIOD:** The equipment should be guaranteed for a period of 12 months from the date of handing over the fully functional unit to the Institute, against manufacturing defects of material and workmanship.
2. **MODE OF SHIPMENT:** The consignment must be air-lifted, insured and transported to the installation site by the supplier.
3. **PAYMENT TERMS:** As per Standard terms agreed.
4. **COMPLIANCE CERTIFICATE:** Enclose compliance certificate along with Technical Bid having details regarding Compliance, Non-compliance, Deviations if any and reasons for deviation in comparison with the Technical Specifications mentioned in this notification.

TERMS AND CONDITIONS FOR SUBMISSION OF BIDS

Both the Technical and Commercial bid should be put in separate sealed envelopes and both the envelopes should be put in another cover subscribing "Rheometer" and should reach "The Chair, Department of Mechanical Engineering, IISc, Bengaluru-560012" on or before 06.05.2021.

The Technical bid must include all the details of technical specifications of the equipment, compliance certificate along with commercial terms and conditions, however, without the price component. The bill of materials printed technical brochure and any other documents to help the technical evaluation of the bid may be enclosed.

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1. The commercial bid must include the price of the item(s) in Indian currency indicating the breakup of
 1. The quotations should be quoted on for-IISc Bangalore basis in INR only.
 2. GST and other taxes like excise duty, entry tax and other applicable taxes which will be payable on the goods if the contract is awarded.
 3. The charges for inland transportation, insurance and other local services required for delivering the goods to IISc, Bangalore.
 4. The installation, commissioning and training charges including any incidental services, if any with applicable service taxes.
2. The invoice to be billed at applicable GST and for concessional GST rates, GST concession certificate(s) shall be provided.
3. Please indicate the import code of the items.
4. Goods found to be defective by the committee during installation and warranty has to be replaced / rectified. Items found not acceptable or missing have to be replaced / rectified. Replacement of parts to be at the cost of the supplier (including all incidental charges), within 15 days from the date of receipt of written communication from us. If there is any delay in replacement / rectification, the warranty period should be correspondingly extended.
5. Conditional tenders shall not be accepted.
6. Bids shall remain valid for minimum of 120 days after the date of bid opening prescribed by the Purchaser.
7. The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders.
8. Onsite inspection of the machine will be done by IISc before the dispatch at IISc cost.

Other Terms

- The cost of the Rheometer and that of each equipment/accessory to be quoted separately.
- The vendor must submit a signed compliance document mentioning whether their equipment meets each and every specification detailed above.
- The award of the tender will be decided by the institute as per price of the complete system. All insurance charges shall be borne by the vendor.

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- Technical and financial bids should be submitted separately.
- All prices of the Rheometer and accessories should be quoted in currency of respective country of origin of the equipment.
- The specifications mentioned shall be understood to be the minimum required. Additional technical and research features suitable to our requirements shall be given due reference.
- Vendors that submit qualifying technical and financial bids are required to send competent representatives from the sales and technical divisions for further negotiations.

All Communications in this regard should be addressed to;

**The Chair,
Department of Mechanical Engineering
Indian Institute of Science
Bengaluru 560012, India.
With attention to: Prof. Saptarshi Basu
Email to: sbasu@iisc.ac.in / saptarshibasukol@gmail.com**