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Date: 20.12.2021

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Ref: IISC/CST/2021/RHE

Tender notification for the procurement of a rheometer for measuring rheological properties of cement-based pastes and similar material

Last date of submission: 6 January 2022

Kindly send your best quotation for an “Rheometer” with the technical specifications/general compliance mentioned below. Please note the following:

1. Quote should come **only from Foreign/ International Original Equipment Manufacturer (OEM) or their Indian authorized distributor.**
2. The quotations should be on FOR-IISc Bangalore basis.

Procedure:

1. The tenderer should submit the technical and financial bids separately in sealed envelopes superscribing the envelopes as ‘Technical bid’ and ‘Financial bid’. Both these envelopes must be put into a single envelope, superscribed ‘TENDER FOR: RHEOMETER’. This should reach the following address by 4 PM on 6 January 2022.

Attn: Dr. Souradeep Gupta
Centre for Sustainable Technologies
Indian Institute of Science,
Bengaluru, Karnataka - 560 012
Contact: +91(80)2293 2447

Soft copies are to be mailed to souradeep@iisc.ac.in with the subject line ‘TENDER FOR: RHEOMETER’

2. The technical proposal should contain a technical compliance table with 4 columns.
 - a. The first column must list the technical requirements, in the order that they are given in the technical requirement below.
 - b. The second column should provide specifications of the instrument against the requirement (please provide quantitative responses wherever possible).
 - c. The third column should describe your compliance with a “Yes” or “No” only. Ensure that the entries in column 2 and column 3 are consistent.
 - d. The fourth column can contain additional remarks. You can use this opportunity to highlight technical features, qualify response of previous columns, or provide additional details.

3. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
4. In the commercial bid, please provide itemized cost of the system and required accessories, such as software, power supply, etc.

Terms and conditions:

1. The decision of the purchase committee is final.
2. The tenderer is required to carry out full testing and demonstration of the rheometer's performance at Indian Institute of Science, along with training the representative(s) from the institute on the operation and some sample testing for acceptance. All guaranteed specifications will have to be demonstrated, upon request, in an active installation. Failure to demonstrate any promised specifications will be deemed as technical non-compliance.
3. The tenderer has a track record of supplying similar equipment to at least two other organizations of similar stature as IISc in India (for instance, IIT or IISERS). Relevant documents including user testimonial on product performance/maintenance shall be furnished.
4. Clarify if periodic (preventive) maintenance be done by a trained on-site engineer or requires a specialist from the OEM. The vendor should have qualified technical service personnel for the equipment based in India and must assure a response time of <2 business days after receiving a service request.
5. The lead-time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order.
6. The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason.
7. The validity of the quotation shall be at least 12 weeks.

Technical specifications:

1. The rheometer shall have concentric cylinder and cup configuration with sand blasted conical rotor to measure rheology of suspensions with fine particles (up to 550 micron) and relatively coarse particles, typically in the size range of 1 mm to 8 mm respectively. Appropriate building material cup and rotor for coarse shall be provided. The type of material to be characterized include cement suspensions, mortar paste (cement, sand and other admixtures with angular and coarse particles up to 6 mm diameter).
2. An additional set of cup and conical rotor shall be quoted for consideration as accessories.
3. Minimum torque in oscillation and shear of at most 5 nN.m and maximum torque of at least 200 mN.m with resolution of 0.01 nN.m shall be provided by the rheometer.
4. Normal/Axial force range of 0.01 to 50 N (or wider) with resolution of 0.005 N. Sensors for measurement of normal force shall be integrated with the rheometer.
5. Angular frequency range of 8E-7 to 628 rad/s.
6. Peltier device (for example, circulator/jacket) and temperature control units with tolerance of -20 to 180 °C shall be provided.
7. The machine should have waveform monitoring capability. The machine should allow fast and accurate strain control.
8. Under oscillation mode tests, the following functions shall be attained:
 - Torque or stress sweep, linear or logarithmic, at single frequency
 - Frequency sweep at single strain
 - Superimposition of stress oscillation under single shear

- Temperature sweep at single torque/frequency
9. Under flow mode tests, the following functions shall be attained
 - Controlled stress/torque sweeps
 - Controlled rate (1/s) and speed (rad/s) sweeps
 - Equilibrium stress-stepped flow
 10. Creep Mode Tests:
 - Constant stress creep and recovery.
 - Automatic sensing of steady state during creep test.
 11. The rheometer must be able to do zero-gap and gap-correction automatically
 12. Air-water separator compressor is to be supplied with the machine.
 13. Preferably, the machine shall have provision of additional fixture for the future, such as magneto-rheology and electro-rheology set-up.
 14. Filter to separate oil, particulate matters or condensates is to be provided.
 15. Computer system compatible with the rheometer software shall be provided by the tenderer. Computer specs: Intel i5 Processor, 1 TB HDD, 8GB RAM, DVD R/W drive, Keyboard, Optical Mouse, 6USB Ports, 19” TFT Screen, Deskjet Coloured Printer, UPS

Other requirement:

1. IISc required **three (3) years complete warranty** from the date of installation for all parts of the rheometer covering any defect that may arise during manufacturing or usage of the machine.
2. IISc will not pay additional for installation and training. All such costs are to be considered in the base price.
3. IISc will expect acceptance tests, post installation. These can be recorded in the presence of representatives of the OEM. Inability to pass these tests will be counted as a technical failure and breach of contract.
 - a. Testing with at least two cement paste samples for demonstration.
 - b. Demonstration of inputs in the software for accurate measurement of rheological properties
 - c. Demonstration of measurement of rheological properties under static shear and dynamic shear for flow sweep mode
 - d. Demonstration of measurement of rheological parameters under oscillation mode and creep mode.

Thanking you,
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