

August 05, 2019

To Whom It May Concern

Limited Tender for Rheometer at MNCF, CeNSE, IISc.

This is an RFQ (Request for Quote) for procurement of an instrument, Rheometer as part of an open tender for the Centre for Nano Science and Engineering (CeNSE) at IISc, Bangalore. CeNSE is a multidisciplinary research department at IISc that houses a 14000 sq. ft. cleanroom and characterization facility used by more than 50 faculty members from various disciplines at IISc. CeNSE also a user- facility which has hosted over 7000 participants from more than 700 universities and institutes all over the world. Consequently, any tool in CeNSE receives significant exposure to scientific community in India and beyond. The vendors are requested to factor in the value of this exposure in to their quotes.

Being a user-facility puts additional technical burden on the tool. We need a tool that can tolerate heavy usage (at least 50 hours/week), has a high uptime, can be serviced and maintained for the foreseeable future (at least 5 years), and has a track record of reliability at comparable facilities in India and abroad. Details of existing facilities and the user program can be gleaned from:

<http://nnfc.cense.iisc.ac.in/>

<http://www.mncf.cense.iisc.ac.in/>

<https://www.inup.cense.iisc.ac.in/>

Procedure

1. Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. Quotes in violation of this will be rejected.
2. **The deadline for submission of proposals is the 30th August, 2019, 5:30 pm Indian Standard Time.** Proposals should arrive at the Main office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, by the above deadline.
3. The decision of the purchase committee is final.
4. The technical proposal should contain
 - a. Relevant technical datasheets. The committee reserves the right to cross-check the information in these datasheets with publicly available information.
 - b. A compliance table with 5 columns. The first column must list the technical requirement, in the order that they are given in the technical configuration below. The second column should describe the capability of the tool for that specific requirement. In case the technical requirement is a question, second column must provide a technical answer. Please be quantitative and consistent with the technical datasheets. Third column must specify whether the technical requirement is met with a "Yes", "No", or "Partially". If the response is "Partially" or "No" the third column, the fourth column must explain the extent of the deviation and, if possible, the reasons for the deviation. The fifth column is for other "Remarks". You can use it to compare your tool with that of your competitors or provide more details/justifications.

- c. Technical capabilities of any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
 - d. Any additional capabilities or technical details that you would like to bring to the attention of the purchase committee. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
5. The technical proposal will be evaluated against the technical requirement. Only vendors who meet the technical requirement will be considered for the commercial negotiation.
6. If multiple systems fulfill the requirements, vendors can offer multiple bids separately.
7. The commercial bid must contain:
 - a. Itemized cost of the system and required accessories, such as software, power supply, etc.
 - b. Itemized cost, as an option, for any suggested accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
 - c. The quotes should be CIF Bangalore, India. So please include cost of shipping to Bangalore. The quote does not need to account for Customs duties.
 - d. Please indicate the warranty provided with the tool. Warrant of 3 years or more is preferred.
 - e. Provide itemized cost for required/expected spares for 3 years of operation. For sake of this calculation, the vendor may assume active tool usage of 50 hours/week. This number will be used to estimate the life cycle cost of the tool.
 - f. The cost of annual maintenance contract. The details of AMC are given below. This number will be used to estimate the life cycle cost of the tool.
 - g. Length of time that the tools will be supported with service and spares from the date of installation. Our requirement is that the tools be supported for at least 5 years from the date of installation. To quote lowest price, vendors often quote for obsolete or soon-to-be obsolete equipment. This is NOT acceptable. For a user facility like CeNSE, it is vital that the equipment be serviceable and supported for the foreseeable future. The length of guaranteed support will be used to estimate the life cycle cost of the tool.
8. As an additional option, provide cost of an annual maintenance contract (AMC) for 3 years, post warranty. The AMC must
 - a. Cover 1 scheduled and 1 emergency visit per year;
 - b. The emergency visit should be supported with a 48-hour response window.
 - c. Clarify if maintenance will be done by a trained local (within India) engineer or a specialist from the OEM.
 - d. Include an itemized list of spares (e.g. maintenance kits) that are essential for scheduled visits;
9. The commercial bids will be evaluated based on life-cycle cost of the tool. This includes the cost of purchase, maintenance, spares, etc.

10. The RFQ must include references of 3 previous installations, preferably in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently.
11. The quote should be valid for 90 days for the equipment mentioned below.
12. We encourage vendors to give technical presentations, physically or over Skype, so that we can better understand the technical capabilities of their tools and vendors can better understand the requirements. To schedule the presentations, the vendors can contact Dr. Suresha S J, GF-12, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. (sureshasj@iisc.ac.in).

Any technical questions can be directed to Dr. Suresha S J/ Grace Abraham, GF-12, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. (sureshasj@iisc.ac.in, graceabraham@iisc.ac.in).

Technical Specifications

(Table below contains list of mandatory items)

Main Instrument		Comments
Measuring head type	Synchronous/DC motor with single drive or better	The instrument should have capability for addition of (i) pressure chamber that can sustain pressures at least upto 100 bars. (ii) module for simultaneous rheometry and optical microscopy. Please provide full technical details in this regard.
Measurement modes	Stress and strain control	
Minimum Torque (Oscillation)	0.5 nN.m or better	
Torque resolution (Oscillation)	0.05 nN.m or better	
Maximum torque (Oscillation)	200 mN.m or better	
Minimum Torque (Steady shear)	5 nN.m or better	
Motor bearings	Air bearings or Magnetic bearings	
Speed range	10 nrad/s-300 rad/s or better	
Step change in strain	<10 ms or better	
Frequency range	1 μ Hz-100 Hz or better	
Motor inertia	<20 μ N.m.s ²	
Strain sensors	High resolution optical encoders with minimum angle measures with minimum angle of measurement is 50 nrad or better	
Measurement types	<ul style="list-style-type: none"> • Rotational • Oscillatory (Strain and stress control) • Steady shear • Stress relaxation • Creep compliance 	Should be able to provide stress and strain control (separately). Should be able to measure elastic modulus (G'), loss modulus (G''), complex modulus (G*), tan delta as a function of time, temperature, frequency, strain and stress in shear mode. Complex viscosity as a function of time, temperature, frequency, strain and stress

Normal Force range	0.005N-50N or better	
Normal force resolution	0.5 mN	
Gap control	Automatic gap compensation	
Gap resolution	0.1 μm	
Solvent trap	Universal solvent trap for minimizing volatile solvent loss from samples along with cover	If universal solvent trap is not available then please supply solvent trap for each specified geometry.
Minimum viscosity to be measured	Water	Please provide appropriate geometry for measurement. Also provide technical literature detailing water viscosity measurement by Rheometer. Demonstration is also required.
Temperature range	-20°C-200°C and flexibility to upgrade	Please mention the options
Geometry: <ul style="list-style-type: none"> • Plate and cone • Concentric cylinder 	<ul style="list-style-type: none"> • For plate & Cone: medium diameter for slightly viscous fluids (suggested 25 mm). One geometry for fluids comparable to water (suggested 40 mm). Angles 1°, 4° • For concentric cylinder - 35 mm or greater. • If above geometries cannot measure viscosity of water, then please provide the suitable geometry in addition to above. 	
Electro Rheology	An additional module could be added to upgrade the base model.	Please mention the accessories needed
Magneto Rheology	An additional module could be added to upgrade the base model.	Please mention the accessories needed
Interfacial Rheology	An additional module could be added to upgrade the base model.	Please mention the accessories needed

Foot Print and weight	<ul style="list-style-type: none"> • Please specify the total footprint in cm, and weight • All site requirements should be clearly mentioned 	
Installation and Training	<ul style="list-style-type: none"> • Installation and training at customer site by the experts. This should be part of the package. • Vendor will be required to demonstrate the operation of the equipment by preparing customer sample. Start up assistance and training on sample preparation has to be provided on-site for user scientists & students. • During the installation the customer should verify all the specifications of the processes for acceptance. • If periodic maintenance can be done by the on-site engineer, please include the cost of training the engineer. • Pre-installation requirements such as room size, tolerable limits of EM field and vibration (mechanical), required power rating; utility requirements are to be stated clearly, and to be verified/surveyed by the supplier at the installation site. It is the supplier's responsibility to clearly provide details of the above-mentioned requirements before delivery of the equipment. • The operator should be not only trained in operating but also know the installation requirements for smooth uninterrupted functioning of the Rheometer. 	
Power Utilities	<ul style="list-style-type: none"> • The instrument should work with Indian standards. • Mention the power requirement. • Mention any utility requirement. 	
Software	Supplied with all the control software analysis and control with complete sample history	Real time visualization of the data should be possible.

Safety	<ul style="list-style-type: none"> • Mention any special safety requirement of the tool. • The tool must come with a complement of interlocks to prevent common user errors. 	
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Optional Items

Microscope Accessories	As per the requirement of Rheometer	
Temperature controller	As per the requirement of the Rheometer and its geometry	
Chiller	Please mention the footspace, pressure and flow rate	
Optical measurements including UV	Please mention specifications	