**Open Tender Notification for the procurement of “Research Grade Modular Rheometer” at the Indian Institute of Science, Bangalore**

**(Last date of submission of tenders: 28-January-2019)**

04.01.2019

Dear Sir/Madam:

Please send your quotation valid for 90 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. The tender should be submitted in two separate sealed envelopes – one containing the “Technical bid” and other containing the “Commercial bid”, both of which should be duly signed and must reach the undersigned on or before 16:00 hours 28-January-2019.

**The Chair,**

**Department of Mechanical Engineering,**

**Indian Institute of Science, Bangalore 560012, Karnataka, India**.

**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 | <10ms or better |  |
| Frequency range | 1μHz-100Hz or better |  |
| Motor inertia | <13 μN.m.s2 |  |
| Strain sensors | High resolution optical encoders with minimum angle measures with minimum angle of measurement is 50nrad or better |  |
| Measurement types | * 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 | -5oC-200oC and flexibility to upgrade |  |
| Geometry:* Plate and cone
* Concentric cylinder
 | * For plate & Cone: medium diameter for slightly viscous fluids (suggested 25 mm). One geometry for fluids comparable to water (suggested 40 mm). Angles 1o,4 o
* 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.
 |  |
| Software | Supplied with all the control software analysis and control with complete sample history |  |

Optional Items:

|  |  |  |
| --- | --- | --- |
| Air Compressor | As per requirement of the rheometer.  |  |
| Air Dryer | As per requirement of the rheometer.  |  |
| Work Station | As per requirement. |  |

**Training, Warranty and AMC**

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

**Terms and Conditions**

1. The vendor should have a good track record of having previously supplied similar equipment to Government funded reputed institutions. Provide at least three such purchase orders.
2. Full technical specifications and all relevant data sheets must be provided with Technical tender. Technical tender should also have a technical specifications compliance sheet.
3. The vendor or its certified agency should have established office in India. Provide details. If agency is quoting on behalf of OEM, then OEM should provide letter about the kind of relationship with the Indian agency.
4. Preferred payment method will be through a letter of credit. Payment terms are negotiable.
5. The lead time for the delivery of the equipment should not be more than 3 months from the date of receipt of purchase order or 2 months from the date of receipt of Letter of Credit(whichever is earlier).
6. The validity period of the quotation should be 90 days.
7. Kindly indicate the import code of the items.
8. If the goods are found to be defective, they have to be replaced or rectified at thecost of the supplier within 15 days from the date of receipt of written communicationfrom IISc. If there is any delay in replacement or rectification, the warranty periodshould 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 thebidding process and reject all bids at any time period withoutthereby incurring any liability of the affected bidder or bidders.