NOTICE INVITING TENDER

Indian Institute of Technology Kharagpur, an Institute of National Importance, invites sealed bids from principal manufacturers or their authorized distributors (foreign firms or their Indian representative companies), who have adequate credential for the Procurement of “Time-of-Flight Secondary Ion Mass Spectrometer (ToF-SIMS)” at the Sophisticated Analytical & Technical Help Institute (SATHI), IIT Kharagpur.

Interested parties may submit their sealed bids under Two-Bids system as per Technical Specifications given at Annexure I and General Terms & Conditions and other formats given at Annexure II to VII. Two covers (Technical Bid and Price Bid) are to be sealed and placed in one large Cover superscribed with tender reference number (Tender No. IIT/CE/ENQ/2020-21/ToF-SIMS dt 19-06-2020) and submitted to "Chairman, SATHI, Attn. Prof. Rahul Mitra, Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Kharagpur, P.O. Technology, PIN - 721 302 on or before 31-07-2020 at 3.00PM. Technical Bids will be opened on 31-07-2020 at 4.00PM.

The technical bid will be evaluated first and price bids will be opened in respect of those OEMs/Vendors, who are found technically qualified after evaluation of Technical bids. Date for opening price bids will be intimated later.

Kindly refer to the Institute website www.iitkgp.ac.in [link: Tenders] for complete tender details. The same is also available in the CPP Portal [https://eprocure.gov.in/eprocure/app]. If there is any corrigendum/addendum, it shall only be published on Institute's Website and Central Public Procurement Portal.

Signature of Indenter /Prof. In Charge, Dept of Metallurgical and Materials Engineering
Head
Department of Metallurgical & Materials Engineering
IIT Kharagpur

To
1. Institute Website
2. CPP Portal
3. Department Notice Board
### TIME EVENTS OF VARIOUS TENDER RELATED ACTIVITIES

<table>
<thead>
<tr>
<th>Enquiry No</th>
<th>IIT/SATHI/ENQ/2020-21/ToF-SIMS dt 19-06-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid Document fee (Non refundable)</td>
<td>Nil</td>
</tr>
<tr>
<td>Last date for submission of sealed tenders/quotations</td>
<td>31-07-2020 at 03.00PM</td>
</tr>
<tr>
<td>Pre-qualification &amp; Technical Bid opening date/time</td>
<td>31-07-2020 at 04.15 PM</td>
</tr>
<tr>
<td>Two Bid System</td>
<td>Two bids – (i) Technical and (ii) Price bid in two separate envelope placed &amp; sealed in one envelope</td>
</tr>
<tr>
<td>EMD</td>
<td>Rs. 16 Lakh (By way of Demand draft from any Nationalized Bank /Commercial Bank and paid in favour of “Indian Institute of Technology Kharagpur”, payable at Kharagpur)</td>
</tr>
<tr>
<td>Submission of bids (by speed post) (Addressed to)</td>
<td>Chairman SATHI Attn.: Rahul Mitra Metallurgical and Materials Engineering, IIT Kharagpur KHARAGPUR 721302, W.B., INDIA</td>
</tr>
<tr>
<td>Name of the item for procurement and technical specifications</td>
<td>Annexure- I</td>
</tr>
<tr>
<td>General Terms and Conditions</td>
<td>Annexure-II to VII</td>
</tr>
</tbody>
</table>
# TECHNICAL SPECIFICATIONS

**Procurement of Time-of-Flight Secondary Ion Mass Spectrometer (ToF-SIMS)**  
(*Enquiry No: IIT/SATHI/ENQ/2020-21/ToF-SIMS dt 19-06-2020*)

<table>
<thead>
<tr>
<th>SNo</th>
<th>Name of the item/Feature</th>
<th>Required Specifications</th>
<th>Quantity (Nos.)</th>
</tr>
</thead>
</table>
| 1.  | Basic Instrument         | • This TOF-SIMS instrument must be capable of high mass-resolution spectrometry, imaging and depth profiling of conducting, semiconducting, insulating and semi-insulating solid material, organic and inorganic material surfaces.  
• All items listed in the specifications below are required unless identified as options. | 01 |
| 2.  | Vacuum System/Chamber    | • The analysis and intro chambers must be constructed of bakeable UHV stainless steel. The analysis chamber can accommodate up to four (4) ion guns.  
• Base pressure in the range of $< 1.2 \times 10^{-7}$ Pa ($< 9 \times 10^{-10}$Torr) or better in the main analytical chamber.  
• Combination of turbo-molecular pump backed by Rotary Pump, Getter Ion-Pump and Ti-sublimation pump with sufficient pumping speeds desired.  
• Safety interlocks must be provided.  
• The intro, analysis and spectrometer chambers must have a bake-out capability comprised of both permanently covered heating tapes and internal lamps.  
• Provision for sample preparation, pre-heating in load-lock chamber  
• Magnetic load-lock chamber to be evacuated separately, in isolation with the main chamber, using an independent pump (preferably TMP). Pumping speed should be sufficient to evacuate within 15 minutes or less.  
• The chambers for sample introduction and analysis must accommodate 100 mm x 100 mm sample holders.  
• The introduction chamber must be compatible with a sample transfer vessel option for the handling and introduction of air/moisture sensitive samples from an auxiliary glove-box environment or other | 01 (Intro-chamber) + 01 (Analysis chamber) |
3. **Heating and Cooling stage**  
- Heating and Cooling of sample stage having a range of at least -150°C to +600°C obtained by one in main chamber or two holders  
- Full 5-axis sample motion with a computer-controlled goniometer must be available during temperature-controlled analysis, e.g. large area stage mapping 1 cm x 1 cm, sample tilt, sample rotation, etc.  
- Temperature control must not be interrupted between the introduction and analysis chamber by e.g. sample transfer using a magnetic transfer rod/arm.

4. **Charge compensation facility**  
- All charge compensation voltages and functions must be fully computer-controlled.  
- The instrument must be equipped with a low energy electron gun, having a variable electron kinetic energy of ≤ 5 eV to 25 eV, for charge compensation during analysis of insulating materials.  
- The instrument must be equipped with a low-energy ion gun (≤ 10 eV Ar⁺) for dual-beam charge compensation during analysis of insulating materials. The low-energy ions must be below the threshold for electron-induced sputtering or surface damage.  
- Tuning for insulator analysis, any sample, must be accomplished by adjusting only a single voltage for the entire system.  
- Secondary ion energies must be constant on different insulating samples to avoid retuning of the mass spectrometer and recalibration of the mass scale from one sample to another.

### Ion Sources

5. **Liquid Metal Ion Gun (LMIG)**  
- LMIG capable of producing atomic and cluster Bi (or Au or Ga) ions.  
- Gas source (Ar⁺, O₂⁺, Xe⁺, etc.)  
- Beam energy up to 30 keV  
- Rastering and gated sampling to avoid side-wall (crater-edges) effect  
- Maximum value of DC current should be at least 20 nA  
- Beam diameter ≤ 0.6 µm in high mass resolution operation @ > 1 nA DC beam current (i.e. HR² mode of operation). The HR² mode is the most useful mode of analysis because it provides both high mass
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
|   | resolution and high lateral resolution simultaneously in a single acquisition without the adverse nonlinear effects of using delayed extraction.  
- Mass resolution > 9,000 |   |
| 6. | Cesium Ion Gun | • The Cs gun must have the following capabilities;  
- Beam energy: 250 eV to 2 keV  
200 nA, < 60 µm at 2 keV  
40 nA, < 45 µm at 500 eV  
- All voltages must be computer controlled.  
- Must have an isolation valve to allow source repair while keeping the main chamber under vacuum.  
- Raster area must be 2,000 µm x 2,000 µm, continuously variable. |
| 7. | Gas Ion Gun | • The source must be computer-controlled electron impact source capable of producing Ar⁺ and O₂⁺ (user-switched gas bottles).  
- Beam energy: 200 eV to 5 keV.  
- All voltages must be computer controlled.  
- The maximum beam current at 5 keV is > 3 µA.  
- Raster area must be 2,000 µm x 2,000 µm, continuously variable. |
| 8. | Gas Cluster Ion Source | Gas Cluster Ion source must be capable of producing Ar⁺ clusters in the range of approximately 600 and 4,000. Lower energy of 1,000 eV or less and maximum energy of 20 keV or more. |
| 9. | Time of flight mass analyzer | • Should be composed of a TOF-TOF imaging mass spectrometer that simultaneously, in a loss-less fashion, produces TOF-SIMS (MS¹) imaging data and tandem MS (MS²) imaging data.  
- The Parallel Imaging MS/MS spectrometer must be constructed of bakeable UHV stainless steel and must have a bake-out capability comprised of both permanent heating tapes and internal lamps.  
- The MS¹ spectrometer must have a two (2) meter flight path to achieve time-of-flight mass separation and dual-polarity operation for detection of either positively charged or negatively charged secondary ions. All spectrometer voltages and functions must be fully computer-controlled.  
- The spectroscopic background and the metastable product ion filtering must be measured according to the following 01 (MS¹) + 01 (MS²) |
specifications: signal-to-background ratio ≥ 2x10^5 measuring the ratio of C_3F_5^+ (over a 0.03 amu mass range) to the background counts at 131.25 m/z over the same mass window. The measurement must be made on un-sputtered PTFE (2 - 3 mm thick) using a 30 keV bunched Ga^+, Au_1^+ or Bi_1^+ primary ion beam, with charge neutralization on, and ≥ 50 eV energy band pass. The signal and background measurements must be obtained from a single mass spectrum collected to a total dose (PIDD) of 1x10^{13} ions/cm^2; no extraction or spectrometer voltages must be changed in order to achieve independent measurement of the signal and the background from two mass spectra.

- The spectrometer must provide ≥ 21° (half angle) secondary ion angular acceptance while operated in the high mass resolution mode. The large (≥ 20° half angle) angular acceptance together with a triple-ESA design is required for superior high mass resolution imaging and depth-of-field on topographically rough specimens. The angular acceptance and mass resolution must be measured according to the following specifications: the ≥ 21° half angle (Ψ ≥ 42°) of angular acceptance measured as the FWHM of a line-scan across the secondary ion image collected from a 125 µm diameter gold wire mounted on a flat Si substrate (the gold wire shall not be embedded into a soft matrix, e.g. indium foil, or coated in any way because this would negate the test of angular acceptance). The measurement must be made of the un-sputtered gold wire using a 30 keV bunched Bi_1^+ (or Ga_1^+ or Au_1^+) primary ion beam and a 500 µm field-of-view. Measurement must be made under conditions of normal extraction voltage without time-delayed extraction.

- The spectrometer must be of a design, which can enable and allow the kinetic energy analysis of secondary ions and imaging using a defined kinetic energy band pass in the range of 20 eV – 240 eV.

- The spectrometer must achieve specification for mass resolution and mass accuracy with a 240 eV secondary ion kinetic energy band-pass. The large (240
eV) kinetic energy bandpass together with a triple-ESA design for superior high mass resolution imaging and depth-of-field on topographically rough specimens is required. The depth-of-field must be $\geq 140 \mu m$ on conducting specimens and $\geq 200 \mu m$ (up to 500 $\mu m$) on insulating specimens.

- The spectrometer must have a sensitivity specification of $\geq 5.5 \times 10^8$ $Al^+$ counts/nC (nC = nano Coulomb).
- The MS$^1$ spectrometer must have three (3) 90 degree electrostatic analyzers (ESAs), i.e. triple-ESA design. The triple-ESA design provides superior signal-to-background (S/B) by automatic filtering of metastable post-source decay (PSD). The spectroscopic background and the metastable product ion filtering must be measured according to the following specifications: signal-to-background ratio $\geq 2 \times 10^5$ measuring the ratio of $C_2F_5^+$ (over a 0.03 amu mass range) to the background counts at 131.25 m/z over the same mass window. The measurement must be made on un-sputtered PTFE (2 - 3 mm thick) using a 30 keV bunched $Bi^+$ (or $Ga^+$ or $Au^+$) primary ion beam, with charge neutralization on, and $\geq 50$ eV energy band pass. The signal and background measurements must be obtained from a single mass spectrum collected to a total dose (PIDD) of $1 \times 10^{13}$ ions/cm$^2$; no extraction or spectrometer voltages must be changed in order to achieve independent measurement of the signal and the background from two mass spectra.
- The MS$^2$ spectrometer must be equipped with monoisotopic (1 Da) precursor selection for precursor ion identification by tandem MS imaging. TOF-SIMS (MS$^1$) imaging and tandem MS (MS$^2$) imaging data should be acquired simultaneously and in parallel; All spectrometer voltages and functions must be fully computer-controlled.
- All TOF-SIMS functions should be maintained; the Parallel Imaging MS/MS must be available in all modes of operation including surface imaging, large area (mosaic map) imaging, depth profiling, and 3D imaging.
- The TOF-SIMS operational frequency ($\geq 8$...
kHz) should be maintained for fast Parallel Imaging MS/MS analysis; Parallel Imaging MS/MS analysis must be performed at a duty cycle of 121 µs/pixel, while collecting MS$^1$ and MS$^2$ data simultaneously.

- Parallel Imaging MS/MS analysis must be compatible with each operational mode of the analytical ion beams, i.e. unbunched (best lateral resolution) and bunched (HR2 mode, best mass resolution + high lateral resolution); the lateral resolution (i.e. analytical beam diameter) in both MS$^1$ and MS$^2$ must be ≤ 500 nm, simultaneously.

- Parallel Imaging MS/MS must be compatible with analysis at the highest resolving power (i.e. smallest analytical beam size) of < 70 nm.

- The tandem MS mass resolution (m/Δm) should be > 3,000 (FWHM).

- Parallel Imaging MS/MS analysis must be conducted using a pulsed primary ion beam.

- More than 70% of the selected precursor ions must be detected at the MS$^2$ detector as product-ions or un-fragmented precursor ions.

- The Parallel Imaging MS/MS must include a license for the NIST MS/MS Reference Library for compound identification. The peaks observed in the product ion spectra (i.e. the MS$^2$ spectra) must also be used for matching in free, on-line software including Lipid maps and METLIN.

- The MS$^1$ and MS$^2$ detectors must be of a dual microchannel plate (DMCP) design with an integral phosphor screen for direct software viewing of secondary ions striking the detector. The detection electronics must be comprised of a multi-stop time-to-digital converter (TDC) including a preamplifier and a constant fraction discriminator (CFD) for enhanced mass accuracy.

- The MS$^1$ spectrometer must have a 20 kV dual-polarity post-acceleration lens for enhanced high mass sensitivity in both the positive and the negative SI polarities. The MS$^2$ spectrometer must have a 14 kV dual-polarity post-acceleration lens for enhanced sensitivity in both the positive and the negative SI polarities.

- The Parallel Imaging MS/MS spectrometer must be ground-referenced (not floated), so
that no tuning or adjustment of the spectrometer voltages, or recalibration of the mass spectrum, is needed when analyzing different materials or insulating / dielectric samples.

- The spectrometer must have a computer-controlled aperture with which to change the angular acceptance. The spectrometer also includes a computer-controlled variable energy slit to change the band-pass kinetic energy window or to conduct kinetic energy-dependent analysis/studies.
- The spectrometer must have high-speed blanking plates following the 3 ESAs that can be used to blank mass regions and prevent specific secondary ions from hitting the detector, and which can be used for Isotope Quantification by Ion Attenuation (IQIA) analysis.
- The spectrometer must have coaxial secondary ion (SI) and secondary electron (SE) detectors for the simultaneous collection of SI and pulsed-SE images. The pulsed-SE and SI images must be in perfect registry without software correction.
- The MS\(^1\) mass resolution (m/Δm) must be > 12,000 (FWHM) at low mass (e.g. 29 m/z) and > 16,000 (FWHM) at high mass (e.g. > 200 m/z) using a 30 keV bunched Ga\(^+\) or Br\(^{79+}\) primary ion beam. High mass resolution operation must be achieved in all modes of operation including surface imaging, large area (mosaic map) imaging, depth profiling, and 3D imaging.
- The MS\(^1\) mass accuracy (Δm/z) should be < 2 milli-u (i.e. < 2 mamu) at < m/z 100, and < 10 ppm at > m/z 100.
- The repetition rate must be proportional to the analytical mass range. The analytical mass range (m/z) should be ≥ 10,000 with the maximum repetition rate of 25 kHz at an analytical mass range of 0 – 200 (to observe all transition elements and isotopes).

### 10. Sample Stage

- A sample stage having 5 axes of sample motion (X, Y, Z, Rotation, Tilt) must be provided, and that should further include the following features:
  1. +/- 50 mm of X,Y travel with 1 μm resolution and 5 μm repeatability.
  2. 20 mm of Z travel with 5 μm resolution.
and 25 µm repeatability.

(3) +/- 15° of Tilt with 0.002° resolution and 0.02° repeatability.

(4) +/- 180° of Rotation with 0.015° resolution and 0.2° repeatability.

- The sample stage must travel between the sample intro chamber and the analysis position under full computer control (no manual introduction rod).
- The time for automated introduction of clean, non-outgassing samples from atmospheric conditions in the intro chamber to UHV conditions at the analysis position must be less than five (5) minutes.
- The sample stage must be compatible with front- and back-mounted samples, having a thickness ≥ 20 mm, as well as cross-sectional sample holders and SEM stubs.
- The sample stage must be capable of utilizing optional sample holders including: hot/cold module, high temperature module, pre-tilted module, metallography puck module, voltage cycling module, sample transfer vessel module, 1 inch (25 mm) prep chamber puck module.
- The sample stage must support switching between all standard and optional specimen holder configurations, as noted above, at the intro position without venting of the analysis chamber.
- The sample stage must be configured with three (3) means by which to measure the primary ion beam current: (a) at any sample surface, (b) at the stage (sample holder), and (c) in a stage Faraday cup.

11. Software and Data Acquisition package

- The instrument control software and data acquisition UI must include a PC-based Windows 10 operating system with color laser printer.
- The instrument control software must include the capability for remote system operation and data acquisition as well as remote diagnostics and service support.
- The data acquisition UI must provide real-time updating and simultaneous display of spectral, image and profile data. The flexibility to alter the displayed data during real-time acquisition, including RAW data stream acquisition, must be provided.
- The instrument control software and data acquisition UI must provide the capability

01 (PC) loaded with software and data acquisition package
for automated sample height adjustment (Auto-Z).

- The instrument control software and data acquisition UI must provide a flexible capability for unattended analysis that includes the ability to define a queue of multiple samples using the navigational image and to further define multiple analyses of any type (spectral/image, depth profile, and mosaic image acquisitions) for the specified sample queue. The capability to use charge neutralization in unattended analysis must be provided. The capability to use Auto-Z in unattended analysis must be provided.

- The data files must be portable and compatible with 3rd party data treatment and multivariate analysis software.

- The data reduction software must have a spectral identification function and should be compatible with the commercial TOF-SIMS library.

- The data reduction software must have 3D imaging and iso-surface modelling software with which 3D volume data sets can be investigated using real-time selection of 2D slices as well as pan, zoom and rotation of the 3D volume.

- The data reduction software must include the capability for batch processing of multiple spectra for both elemental and molecular identification and export of results to Excel tables.

- The entire ToF SIMS System must have the facilities and interface for full integration and complete embedding facilities for MS² detector upgradation.

<table>
<thead>
<tr>
<th>12</th>
<th>Tool-kit</th>
<th>Complete/Multipurpose tool-kit <em>(preferably with a sensitive digital multimeter for basic electrical tests)</em> for routine operation, trouble shooting and maintenance of ToF-SIMS should be provided.</th>
<th>01</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Consumables for TOF-SIMS</td>
<td>The Vendor should provide as spares, all metal gaskets, O-rings, pump oil for backing rotary pump, materials for ion-sources for 5 year period.</td>
<td>Sufficient for 5 year duration for normal operation (24 X 7) h per week</td>
</tr>
<tr>
<td>14</td>
<td>Uninterrupted Power Supply (UPS)</td>
<td>UPS with suitable rating adjusted to operate the entire system in case of power failure with battery back-up of at least 1 h should be</td>
<td>01 No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td><strong>Chiller with Compressor</strong></td>
<td>The system should be complete in all respects and should be delivered with all essential accessories including a water-chiller with compressor of adequate capacity should be provided along with the basic equipment and accessories.</td>
<td><strong>01 No.</strong></td>
</tr>
<tr>
<td>16.</td>
<td><strong>Gas Cylinders</strong></td>
<td>High pressure gas cylinders of spectroscopically pure (preferably 99.999% purity) oxygen, argon, and xenon as well as high purity nitrogen (for venting).</td>
<td><strong>01 No. each for O₂, Ar &amp; Xe 02 Nos. for N₂.</strong></td>
</tr>
<tr>
<td>17.</td>
<td><strong>Dehumidifier</strong></td>
<td>A dehumidifier of suitable capacity (depending on the size of room housing the instrument) should be provided.</td>
<td><strong>01</strong></td>
</tr>
<tr>
<td>18.</td>
<td><strong>Guarantee/Warranty of above items</strong></td>
<td>The entire SIMS-TOF system including UPS and Chiller should be covered for comprehensive warranty of at least 3 years from the manufacturer, with the considered period starting after successful installation and demonstration. If there is breakdown within the Warranty Period, the Warranty period must be extended by a period equal to the break-down period after the expiry of initial warranty. Price of additional warranty extension per year should be quoted. All parts including accessories should be covered under the warranty and this fact should be specified in the tender document. The comprehensive warranty should cover: i. All parts including accessories, consumables, and labour on site ii. Free maintenance and service on site or at factory with no cost, and iii. Regular up-gradation of software’s free-of-charge</td>
<td></td>
</tr>
</tbody>
</table>
| 19. | **Pre-Installation Requirements** | • Complete technical details of pre-installation requirements should be furnished along with the technical bid to ensure quoted performance.  
• Vendors must conduct the site survey before installation at no additional cost. |   |
| 20. | **Training** | The supplier or manufacturer should also provide dedicated of at least one-week advanced level training. |   |
| 21. | **Support and Service** | • The manufacturer and/or their Indian representative must have at least two qualified and factory trained service engineer in India to be able to attend to service Training certificates from the |   |
22. Power Supply

- Should meet all applicable Indian Electric Power standards

**Optional Items for ToF-SIMS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Oxygen Leak capability</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The instrument must be equipped with an oxygen insertion capability for enhancing positive ion yields during analysis.</td>
</tr>
<tr>
<td><strong>01</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2. FIB Gun Option</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The FIB Gun must operate at voltages from 15 kV to 30 kV.</td>
</tr>
<tr>
<td></td>
<td>The FIB Gun must achieve a beam diameter of &lt; 70 nm and must produce a beam diameter of ≤ 400 nm at ≥ 20 nA DC beam current.</td>
</tr>
<tr>
<td></td>
<td>The FIB Gun must include full scanning electronics and intuitive software UI for FIB operation and tuning; the software UI must include a graphical interface for user definition of the sample feature(s) to be milled, sectioned and/or polished. The software also must provide the capability to collect, save and recall FIB-generated secondary electron (SE) images in the course of tuning, milling and tomography.</td>
</tr>
<tr>
<td><strong>01</strong></td>
<td></td>
</tr>
<tr>
<td><strong>3. Transfer Vessel Option</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For Inert gas transfer from controlled atmosphere glove box to analytical system</td>
</tr>
<tr>
<td><strong>01</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Additional compulsory supporting items:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stylus Profilometer</strong> to be provided for measuring SIMS crater-depth as well as 2-D/3-D surface roughness/texture (topographical image of the surface)</td>
<td><strong>Quantity (Nos.)</strong> 01</td>
</tr>
<tr>
<td>Specifications: Step height: nanometres to 1000 µm</td>
<td></td>
</tr>
<tr>
<td>Low force with constant force control: 0.03 to 50 mgf</td>
<td></td>
</tr>
<tr>
<td>Should be able to scan full diameter of the sample without stitching</td>
<td></td>
</tr>
<tr>
<td>Video: 5 MP high-resolution colour camera</td>
<td></td>
</tr>
<tr>
<td>Arc correction: Removes error due to arc-motion of the stylus</td>
<td></td>
</tr>
<tr>
<td>Software: Easy to use software interface</td>
<td></td>
</tr>
</tbody>
</table>
Production capability: Fully automated with sequencing pattern recognition.

Vibration isolation table for stylus profilometer should be provided with compressor-cum-motor.

<table>
<thead>
<tr>
<th>Terms and conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sl. No.</strong></td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
</tbody>
</table>

Annexure-II
GENERAL TERMS AND CONDITIONS

1. Last Date of Submission of Sealed Bids (both technical and price bids, separately in two covers and placed, sealed in one envelope): 31-07-2020 up to 3.00 P.M.

2. The Technical bids will be opened on dt: 31-07-2020 at 4.15 P.M. in the room of Head, Department of Metallurgical and Materials Engineering, I.I.T. Kharagpur, India.

3. Payment Terms & Performance Bank Guarantee (PBG): 90% payment will be made on submission of shipping documents and balance 10% payment will be made on installation, commissioning and submission of PBG for performance period if the payment is made by LC, otherwise 90% will be made after successful installation and commissioning duly certified by the concerned Head of Department. Balance 10% may be released against submission of Performance Bank Guarantee to the tune of 10% of the total purchase order value. PBG shall be issued from any nationalized bank/commercial bank, validity which shall be warranty period plus 60 days drawn. No advance/mobilization support, is payable against supply of stores. In the event of failure to deliver the stores beyond the specified date, liquidated damages @ 1% per month or part thereof in respect of the value of stores will be deducted, subject to a maximum of 5%; alternately the order will be cancelled and the undelivered stores purchased from elsewhere at the risk and expense of the vendor.

4. Warranty/Guarantee & On-site skill support: Three years (03) onsite comprehensive OEM warranty from the date of successful installation and commissioning. The firm has to guarantee supply of spares for a minimum period of 10 years.

5. Earnest Money Deposit (EMD): An amount of Rs. 16 Lakh (Rupees Sixteen Lakhs only) in the form of Demand Draft drawn in favour of “Indian Institute of Technology Kharagpur”, payable at Kharagpur or Bank Guarantee as per format at Annexure V. E.M.D. should be enclosed separately in an envelope and stapled with the Technical Bid document superscribing EMD. The validity of the EMD should be 6 (six) months from the date of issue. Any bid without EMD will be summarily rejected. No interest is payable on EMD. EMD will be refunded to the unsuccessful bidder, finalization of the tender process. The EMD of vendor awarded with the contract to be treated as part of security deposit towards Performance Guarantee. No interest is payable on Security Deposit. Security Deposit shall be forfeited if the selected vendor after award of contract, fails to execute the same.

6. Tender Fee: No tender fees / Rs. _Nil__/-(By way of demand draft from any Nationalized Bank /Commercial Bank and paid in favour of “Indian Institute of Technology Kharagpur”, payable at Kharagpur).

7. IIT Kharagpur will give exemption for submission of tender fee and EMD who are registered with MSME, NSIC or start-ups as recognised by DIPP as per revised rule 170 of GFR – 2017 only. However proper and valid document in this regard must be submitted by the bidders in support of their claim.
8. Tender fee and EMD should be kept in separate covers and place in technical bid cover.

9. **Delivery of Stores**: The store items are to be supplied within 90 days from the date of receipt of the Purchase Order.

10. **Price**:
   
   a. PRICE may be quoted either in INR or in foreign currency.
   
   b. Where tenderer intends to quote in Indian Rupees (INR), the price should be quoted “FOR IIT Kharagpur” basis. The price should be all inclusive.
   
   c. Indian institute of Technology Kharagpur is a public Funded Academic & Research institute under the minister of Human Resource Development and is eligible for GST @5% vide Notification No.47/2017 dated:14.11.2017 and 10/2018- Integrated Tax (Rate) dated:25.01.2018 by the Ministry of Finance, Department of Revenue. Necessary certificate in this regard will be issued as per requirement and on request of the successful bidder.
   
   d. Where tenderer intends to quote in foreign currency FCA/FOB source port price by Air/Sea to be quoted. In case of comparison between FOR IIT Kharagpur (quoted in INR) and FOB/FCA price (quoted in foreign currency) 20% will be added on FOB/FCA price after conversion to INR.
   
   e. Tenderer, who are Indian Agents of OEMs, should furnish a clear declaration as follows: We declare that I am/we are Accredited Agents of the suppliers aboard. DGS&D enlistment certificate needs to be attached (applicable only for the Indian Agents).
   
   f. Foreign bidders to disclose the name and address of agent and representative in India.
   
   g. IIT Kharagpur is registered DSIR, Govt. of India and eligible for exemption for payment of Customs Duties in Terms of Government of India Notification No.51/96-Customs dated 23.07.96. Necessary certificate in this regard will be issued as per requirement and on request of the successful bidder.
   
   h. Agency Commission, if any will be paid to the Indian agents in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances.
   
   i. The unit prices should be for the same unit as indicated in the Schedule to tender enquiry and not for any other unit.
   
   j. Discount, if any, should be indicated separately/prominently.
   
   k. Offers should normally be on fixed and firm price basis. Any clause making price variation will not be acceptable.

11. **Bid**: Technical Bid and Price Bid should be submitted in two separate sealed envelopes quoting reference number on the top of the envelope. **EMD should be enclosed with the Technical Bid documents, in separate sealed envelopes, stapled with the packet containing Technical Bid documents.**

12. **Acceptance of Tender**: The Authority of IIT Kharagpur does not bind itself to accept the lowest priced bid and reserves the right to reject any or the entire tender bids received without assigning any reason thereof.
13. The addendum/corrigendum if any shall be published on Institute's Website i.e. www.iitkgp.ac.in and on CPP Portal.

14. **Extra Features:** If the bidder provides any other extra features on the Hardware or Software which are not mentioned in the tender product specifications, then that shall be highlighted in clear terms, with documentary evidence/literature.

15. **Compliance List:** The proposal should be properly indexed and a compliance list against the technical specifications should be provided.

16. **Service:** Response to ensure quality of services, the deputed Engineer from the OEM/Vendor shall have a minimum of 2 years of experience in the relevant field and must be in the payroll of the OEM/Vendor.

17. **Installation and Commissioning:** Free of cost at Sophisticated Analytical & Technical Help Institute (SATHI), IIT, Kharagpur. The supplier must ensure timely installation of Experimental test setup with necessary support to the indenters, as per details and lists to be made available by the Stores & Purchase Section or the indenting Departments/Centres/Schools.

18. **Period of Validity:** Bids shall remain valid for acceptance for a period of 90 days from the date of opening of the price bid.

19. The benefit of any downward price revision (revision on account of budget/financial policy, tax revision, EPZ etc.) is to be given to IIT Kharagpur by the selected OEM/vendor.

20. Past Performance of the Vendors will be judged at the time of Technical Evaluation.

21. The Institute does not bind itself to offer any explanation to those bidders whose technical bids have not been found acceptable by the Technical Evaluation Committee of the Institute.

22. Bidders should enclose the following documents:
   
   a. Certificate of Registration / Trade License
   b. Copy of mandatory test reports, national testing/reliability and endurance test reports etc., certified or conducted at the manufacturing site, granted by the bureaus/quality control departments/national testing laboratories.
   c. Proforma Price Bid (without mentioning the price rate) may be attached with technical bids
   d. Port or place of Shipment: Should be mentioned in the quotation.
   e. Purchase order to be placed on: Should be mentioned in the quotation with full address, email address, phone number.

23. All tenders are to be handed over in a sealed box in the Office of Department of Metallurgical & Materials Engineering, IIT Kharagpur-721302. The bids (technical and price bids) once submitted shall be the property of the Institute and shall not be returned to the vendor in future. For speed post, the Postal Address is “
24. Opening of Price Bids: The Price Bid(s) of only those vendor(s) who are found technically qualified will be opened and the same will be opened before the technically qualified vendor(s). The date for opening of price bids will be notified separately by email.

25. Tenderer or his/her authorized representative (with proper authorization letter for attending opening of technical bids and also for opening of price bids) may choose to be present at the time of opening of Technical Bids/Price Bids.

IMPORTANT

I. Director may accept or reject any or all the bids in part or in full without assigning any reason and does not bind himself to accept the lowest bid. The Institute at its discretion may change the quantity/upgrade the criteria/drop any item or part thereof at any time before placing the Purchase Order.

II. The technical bid will be evaluated first and price bids will be opened in respect of those OEMs/Vendors, who are found technically qualified after evaluation of Technical bids. Date for opening price bids will be intimated later.

III. A bid submitted with false information will not only be rejected but also the OEM/ vendor will be debarred from participation in future tendering process.

IV. In case of any dispute, the decision of the Director of this Institute shall be final and binding on the bidders.

V. For any query pertaining to this bid document, correspondence is to be addressed to the End User

Prof. Rahul Mitra,
Department of Metallurgical & Materials Engineering,
Indian Institute of Technology Kharagpur- 721302, West Bengal, India
[Ph:+91-03222-282280] Email: rahul@metal.iitkgp.ac.in (copy to sathi@iitkgp.ac.in )

VI. In case the due date for opening tender happens to be a holiday, the same will be opened on the next working day. The timings will however remain unchanged. Please Note that the Institute remains closed on Saturday & Sunday.

VII. The Bidders are requested to submit the bids after issue of clarifications only considering the changes made if any. Bidders are totally responsible for incorporating/complying the changes/amendments issued if any, in their bid.
INSTRUCTIONS & SPECIAL CONDITIONS

1. **GENERAL**: Tenderer, who are Indian Agents of OEMs, should furnish a clear declaration as follows: We declare that I am/we are Accredited Agents of the suppliers aboard. DGS&D enlistment certificate needs to be attached (applicable only for the Indian Agents).

2. **DEVIATION FROM SPECIFICATIONS**: It is in the interest of the tenderer to study the specifications in the tender schedule thoroughly before quoting so that, if the tenderer makes any deviations, the same are prominently brought out in the body of the tender. If you need to add any optional items to your system in order to meet our specifications, you are requested to quote for the total including the option required to suit our requirements. Otherwise, your tender will not be considered at all.

3. **TENDERERS SHALL SUBMIT ALONG WITH THEIR TENDER**: (i) Complete address and tele links for contact persons of principals and Indian agent offices dealing with this purchase. (ii) Name and full address of the OEM’s Banker and their swift code. (iii) Port of shipment and Country of origin is to be provided for each item. (iv) Purchase order to be placed on: Should be mentioned in the quotation with full address.

4. **PERFORMANCE BANK GUARANTEE**: On behalf of the Principal, Indian Agent must be able to provide Performance Bank Guarantee of the amount equivalent to the 10% of the cost of equipment from any Nationalized Bank. The Performance Bank Guarantee is required for the entire period of Warranty. Performance Bank Guarantee must remain valid for a period sixty days beyond the expiry of the Warranty Period. Bid security will be refunded back on submission of performance Security.

5. **GUARANTEE**: The tenderer has to declare that the goods sold to the buyer under this contract shall be of the best quality and workmanship and shall be strictly in accordance with the specifications.

6. **JURISDICTION**: All questions, disputes, or differences arising under, out of or in connection with the contract, if concluded, shall be subject to the exclusive jurisdiction at the place from which the acceptance of Tender is issued i.e. Jurisdiction of KOLKATA HIGH COURT. Acceptance to this effect is also necessary at the time of opening of Technical Bid.

7. **ACKNOWLEDGMENT**: It is hereby acknowledged that we have gone through all the points listed under “Instructions & Special Conditions” outlined above, and those in the accompanying note on “Important Conditions”, and we agree to abide by them under the penalty of permanent disqualification for Tender participation and for related penal actions for non-abidance of the conditions.

8. Interested vendors must be able to supply adequate spares and consumable during three years of comprehensive warranty. Vendor should also ensure trouble free service and performance for another seven years beyond three years Comprehensive Warranty Period with adequate spares and accessories.
### ANNEXURE - IV

**Eligibility Criteria / TECHNICAL BID**

<table>
<thead>
<tr>
<th>S. No</th>
<th>Description</th>
<th>Submitted (Yes / No )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Registration Certificate</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PAN and GST Certificates</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Status of the Tenderer&lt;br&gt; <em>(attach documents, if registered company/partnership/proprietyship)</em></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Whether OEM/representing foreign principle&lt;br&gt; <em>(attach copy of certificate/authorization)</em></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Details of key top official/authorized official with email id and contact number</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Income Tax Returns of latest last three years</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Average turnover of company in last three years should be of Rs._________lakhs</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Current list and address of clients where <strong>One similar material/products has been supplied</strong> <em>(attach Pos)</em> and satisfactory certificates from the users.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Name and address of Vendor’s bankers and attach a Solvency Certificate from the Bank for a minimum amount of Rs.___ Lakh</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Other documents like literature, catalogues etc., <em>(if any)</em></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

1. Attach all relevant documents in the same serial order as above, properly indexed, duly signed.

2. **This is to be submitted in a separate sealed envelope** super scribing **“TECHNICAL BID”**, Notice inviting **Tender Reference no:** ____________ date: ________ and name of the bidder.

3. Price bid of that company/firm only will be opened which do technically qualify, for further consideration. **Attach all relevant documents in the same serial order as above, properly indexed, duly signed and sealed.**

**Signature and seal of the Bidder**
ANNEXURE - V

DECLARATION

1. I, .......................... Son / Daughter of Shri ............................ .......................... Proprietor/Partner/CEO/MD/Director/Authorized Signatory of M/s. .................................... am competent to sign this declaration and execute this tender document.

2. Tender ref no: ___________________________  dt:__________ . I have carefully read and understood all the terms and conditions of the tender and hereby convey my acceptance of the same.

3. The information/ documents furnished along with the above application are true and authentic to the best of my knowledge and belief.

4. I/we am/are well aware of the fact that furnishing of any false information/ fabricated document would lead to rejection of my tender at any stage besides liabilities towards prosecution under appropriate law.

5. Each page of the tender document and papers submitted by my Company is authenticated, sealed and signed, and I take full responsibility for the entire documents submitted.

6. I/we hereby confirm and declare that I/we am/are not blacklisted /De-registered / debarred by any Government department/ Public Sector Undertaking/ Private Sector/ or any other agency for which we have Executed/ Undertaken the works/ Services.

Signature of the Authorized Person

Date: -----------------------------

Full Name: -----------------------------

Place: -----------------------------

Company Seal: --------------
MODEL BANK GUARANTEE FORMAT FOR FURNISHING EMD

Whereas .................................................................(thereinafter called the “tenderer”) has submitted their offer dated ................................................................. for the supply of ................................................................. (hereinafter called the “tender”) against the purchaser’s tender Notice No. .................................................................

KNOW ALL MEN by these presents that WE ................................................................. of ................................................................. having our registered office at ................................................................. are bound unto .................................................................(hereinafter called the “Purchaser”) in the sum of ................................................................. for which payment will and truly to be made to the said Purchaser, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this ..................Day of .................. 20 ..........

THE CONDITIONS OF THIS OBLIGATION ARE

(1) If the tenderer withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of this tender.

(2) If the tenderer having been notified of the acceptance of his tender by the Purchaser during the period of its validity:
   (a) If the tenderer fails to furnish the Performance Security for the due performance of the contract.
   (b) Fails or refuses to accept/execute the contract.

WE undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or both the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including 45 days after the period of tender validity and any demand in respect thereof should reach the Bank not later than the above date.

(Signature of the authorized officer of the Bank)
Name and designation of the officer
Seal, name & address of the Bank and address of the Branch
**ANNEXURE – VII**

(on the official Letterhead of the firm)

**FINANCIAL BID**

Tender ref no: ____________________________ dt: ____________

Tender for Supply, Installation, Testing and Commissioning of _______ equipment with ___ Years of warranty.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Qty</th>
<th>Unit Price without taxes (in Rs.)</th>
<th>Taxes Rs</th>
<th>Unit Price with Taxes (in Rs.)</th>
<th>Total Amount (in Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply and Installation, Testing and Commissioning of XXXXXXXX Equipment with XXXXX years of warranty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In words: Rupees _________________________________________________________

1. In case of discrepancies between words and figures, the bid which is least of the two versions will be confirmed.

2. Indian institute of Technology Kharagpur is a public Funded Academic & Research institute under the minister of Human Resource Development and is eligible for GST @5% vide Notification No.47/2017 dated:14.11.2017 and 10/2018- Integrated Tax (Rate) dated:25.01.2018 by the Ministry of Finance, Department of Revenue.

**Signature of the bidder along with seal**
Checklist for Enclosures
(Bidder Should fill up YES or NO and page number without fail)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Bid Enclosures</th>
<th>Yes/No</th>
<th>Pg. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>Technical Bid (Envelope – A)</strong> contains the following documents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Registration Certificate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PAN and GST Certificates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Status of the Tenderer (attach documents, if registered company/ partnership/ proprietyship)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Whether OEM/representing foreign principle (attach copy of certificate/authorization)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Details of key top official/authorized official with e-mail id and contact number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Income Tax Returns of latest last three years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Minimum turnover of company of last three years should be of Rs._______lakhs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Current list and address of clients where <strong>three similar material/products has been supplied</strong> (attach Pos) and satisfactory certificates from the users.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Name and address of Vendor’s bankers and attach a Solvency Certificate from the Bank for a minimum amount of Rs.___Lakh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Other documents like literature, catalogues etc.,(if any)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Tender fee (should be kept in one envelop cover and place technical bid)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>EMD (Should be kept in one envelop cover and place in technical bid cover)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financial Bid (Envelope – B)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Price Bid (As per the format given at Annexure – VII)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All pages of the bid documents must be serially numbered and signed.