



# Indian Institute of Technology Kanpur

## Advanced Center for Materials Science

**Enq. No.: ACMS/ AU/ 2012-13/ E-16**

**Enquiry Dated: March 12 2013**

**Closing Date: March 21<sup>st</sup>, 2013**

ACMS requires the quotation for one **Electron Probe Micro Analyzer (EPMA)** complying with or better than the specifications mentioned in **Appendix A**. The EPMA should be capable of analyzing all the elements ranging from B to U in WDS mode. The EPMA will be used for quantitative analysis of multicomponent alloys in point-by-point analysis, continuous line scan and area mapping mode. The EPMA should be able to operate for long hours with excellent beam stability. The closing date for the above item is **March 21<sup>st</sup>, 2013**.

The prospective suppliers are required to send quotation in two parts in sealed envelopes, as "Technical Bid" and "Financial Bid". The Technical Bid should contain detailed technical specification of the product being offered and should not mention any prices. The Financial Bid should include the detailed price quotation clearly including the cost of the equipment, taxes, service charges if any, shipping and handling charges. The two separate and sealed envelopes should be clearly marked appropriately as "Technical Bid" and "Financial Bid".

### Terms and Conditions:

1. Maximum education discount, if any should be offered
2. Validity of quotation should be at least for 60 days
3. Prices should be on CIF and FOB separately (if imported)
4. Prices should include the installation and training cost
5. Warranty should be for at least three years after installation
6. Normal payment terms for the Institute will be applicable (90% on delivery of the items and the remaining 10% after satisfactory installation/ inspection)
7. Quotation should carry proper certifications like agency certificate, proprietary certificate, etc.
8. An undertaking that the vendor will supply all the spares and services for the equipment for at least 10 years from the date of commissioning
9. Delivery should be made within 9 months

Kindly send the Technical and Financial bids in sealed envelopes latest by 21<sup>st</sup> March 2013 to:

**Dr. Anish Upadhyaya**  
**Head, Advanced Center for Materials Sciences**  
**IIT Kanpur, U.P. 208016, India.**  
**e-mail: [anishu@iitk.ac.in](mailto:anishu@iitk.ac.in)**

## Appendix A

### Technical Specifications for Electron Probe Micro Analyzer (EPMA)

| Sr. No | Parameter                     | Required Specification <sup>1,2</sup>   |
|--------|-------------------------------|---|
| 1.     | Description                   | One Electron Probe Micro Analyzer with minimum three WDS spectrometers, EDS detector, SE detector and BSE detector. Appropriate crystals should be included for the quantitative analysis of all the elements ranging from B to U.  |
| 2.     | Model Name                    | Clearly mention make, model and model number of the equipment being offered.  |
| 3.     | Electron Beam Source          | <ul style="list-style-type: none"> <li>• Field Emission gun, LaB6 or CeB6. Make separate quotation for each one if more than one beam-sources are offered.</li> <li>• Accelerating voltage range should be 1kV to 30kV or better</li> <li>• Beam current up to 0.5μA or better</li> <li>• Beam stability should be +/- 0.2% per hour or better</li> <li>• Minimum beam diameter of 600nm or lesser should be possible</li> </ul>  |
| 4.     | Detectors                     | <ul style="list-style-type: none"> <li>• At least three wavelength dispersive spectrometers (WDS) with appropriate crystals to cover entire range of elements from Boron to Uranium with high sensitivity</li> <li>• Each spectrometer should consist of two or more crystals</li> <li>• Separately quote for two additional WDS channels</li> <li>• EDS detector</li> <li>• SE detector</li> <li>• BSE detector</li> </ul>   |
| 5.     | Resolution and magnifications | <ul style="list-style-type: none"> <li>• 6 nm or better resolution for SE imaging</li> <li>• 1 micron or better spatial resolution for compositional analysis</li> <li>• Magnification of 40X to 100000X should be possible</li> </ul>  |
| 6.     | WDS Spectrometers             | <ul style="list-style-type: none"> <li>• Appropriate crystals should be incorporated in the given configuration to cover the elemental range from B to U</li> <li>• Automatic and fast crystal change should be possible</li> <li>• Rowland circle of diameter 100 mm or greater</li> </ul>   |
| 7.     | Sample Stage                  | <ul style="list-style-type: none"> <li>• Samples up to 50mm x 50mm in cross sections should be accommodated</li> <li>• Automatically controlled X, Y and Z movement</li> <li>• Ranges: 50mm or more in X and Y and 2 mm or more in Z with minimum step size of 0.5μm or lesser</li> <li>• The stage should be able to be controlled manually as well as through software</li> <li>• Suitable sample holders should be provided with at least one holder for accommodating up to 6 samples at a time</li> </ul>                                    |
| 8.     | Analysis Capabilities         | <ul style="list-style-type: none"> <li>• Quantitative, qualitative and semi-quantitative WDS and EDS analysis should be possible</li> <li>• All three modes viz. point, line and area scan modes should be possible</li> <li>• It should be possible to set up a sequence of point analyses (WDS mode) in advance and the beam stability should be ensured over the entire analysis time. Autofocussing should be possible before analyzing every pre-set point.</li> <li>• Software for ZAF correction application should be included</li> </ul> |

## Appendix A

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|-----|--|---|
| 9.  | Analysis Standards                       | <ul style="list-style-type: none"> <li>Standards for all common elements and simple compounds should be included on a single or couple of blocks that can be accommodated in the sample chamber</li> </ul>  |
| 10. | Software                                 | <ul style="list-style-type: none"> <li>The software should be interactive and user-friendly, meant for easy control, operation, data-capture and data-analysis</li> <li>Beam parameters, sample stage movement, focusing and setting up of analysis should be controlled through the software</li> <li>Status of analysis as well as of instrument should be continuously displayed on the screen</li> <li>It should be possible to set a sequence of point-by-point analysis over a cross section of at least 500<math>\mu</math>m x 500<math>\mu</math>m and the beam stability be ensured until the end of the analysis. The data should be collected and systematically stored for the entire set analysis</li> <li>Separately list along with prices for additional software offered for smooth control of equipment and accurate data analysis</li> <li>The instrument should be installed with latest available version of software for control, operation and analysis.</li> <li>The supplier should upgrade the software as and when the up gradations become available for at least five years from installation</li> </ul> |
| 11. | Vacuum System                            | <ul style="list-style-type: none"> <li>Vacuum system should be controlled automatically</li> <li>A two stage vacuum system with DP/TMP backed up by rotary pump should be provided</li> </ul>   |
| 12. | Computer and Printer                     | <ul style="list-style-type: none"> <li>The EPMA should come with a high performance computer with all the software installed on it</li> <li>Minimum Configuration: Intel dual core processor, 2GB RAM, 500Gb Hard Disk, Two 24" Displays for simultaneously displaying WDS/EDS controls and SE/BSE images with other essential peripherals</li> <li>Laser printer should be provided with the computer</li> </ul>   |
| 13. | Power Supply and UPS                     | <ul style="list-style-type: none"> <li>Specify the requirements of the power supply for the offered EPMA</li> <li>UPS should be provided with the EPMA with the minimum back-up of one hour to run the EPMA, computer and printer</li> </ul>  |
| 14. | Documentation                            | <ul style="list-style-type: none"> <li>Two sets of operating manuals for the equipment and control system should be provided in hard copies</li> <li>A soft copy of the above manuals should also be provided in a CD/DVD</li> </ul>  |
| 15. | Safety Norms                             | <ul style="list-style-type: none"> <li>The instrument should be compliant with international norms for safety and environment</li> </ul>  |
| 16. | Installation, Commissioning and Training | <ul style="list-style-type: none"> <li>The delivery of the EPMA should be considered complete only after successful commissioning of the instrument</li> <li>The pre-installation requirements should be communicated to IIT Kanpur well in advance of the installation</li> <li>The Installation, commissioning and training should be done only by well trained factory engineers</li> <li>The supplier should provide training to at least two candidates</li> </ul>   |

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|   |                                |   |
|---|--------------------------------|---|
|   |                                | at the installation site to make them familiar with smooth operation of the instrument  |
| 17.   | After-sales Service            | <ul style="list-style-type: none"> <li>• The supplier should provide a prompt after-sales service such as regular instrument maintenance, troubleshooting and fixing</li> <li>• The list of service centers in India should be included.</li> </ul>   |
| 18.   | Spares                         | <ul style="list-style-type: none"> <li>• List of standard spares to be provided for each year starting from 1st to 5<sup>th</sup> year along with cost and discounted rates</li> <li>• An undertaking that the vendor will supply all the spares and services for the equipment for at least 10 years from the date of commissioning</li> </ul> |
| 19.   | Sample preparation accessories | • Optionally include the list and costs of standard accessories required for preparation of sample for EPMA analysis  |
| 20.   | Annual Maintenance Cost        | Include the cost of annual maintenance for each year for five years after the warranty period.  |
| <sup>1</sup> . Above specifications are desirable and the actual specifications for your systems should be clearly mentioned.<br><sup>2</sup> . Additional optional accessories should be indicated and quoted separately |                                |   |