TENDER

FOR

SUPPLY & INSTALLATION OF NANOINDENTATION
FOR SCHOOL OF ENGINEERING,

IIT MANDI

Tender No.: IITMANDI/Admin/PUR-148/2014-15/7518-19

Tender date: 10th February, 2015

Last Date of submission: 3rd March, 2015

Indian Institute of Technology, Mandi

Transit Campus: Mandav Hotel, 2nd Floor (Near Bus Stand), Mandi – 175001 (H.P)

Tel.: 01905-237929 **Email**: viswa@iitmandi.ac.in

Indian Institute of Technology Mandi, Mandi invites tender for supply, erection & installation, of **Nanoindentation,** as per specifications given in the Annexure attached to the Tender form. All offers should be made in English and should be written in both figures and words. Tender forms can be downloaded from the website (http://iitmandi.ac.in/administration/tenderseoi.html) of the Institute.

The bidders are requested to read the tender document carefully and ensure compliance with all specifications/instructions herein. Non-compliance with specifications/instructions in this document may disqualify the bidders from the tender exercise. The Director, IIT Mandi, Kamand reserves the right to select the item (in single or multiple units) or to reject any quotation wholly or partly without assigning any reason. Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored and rejected.

Terms and Conditions:

1. The technical and financial bids should be quoted separately and put in different sealed envelopes marked "**Technical bid**" or "**Financial bid**" as applicable. These separate bids envelopes are to be put in an outer envelope which should also be sealed.

2. The Vendors who have earlier supplied the equipment to any of the IITs, IISc, IISERs and other Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids.

3. The technical and financial bids should be submitted in original. The financial bid should include the cost of main equipment/item and its accessories. If there is any separate cost for installation etc. that should be quoted separately.

4. Each individual sealed envelope as well as the outer envelope should be marked with the following reference on the top left hand corner: "**IITMANDI/Admin/PUR-148/2014-15/7518-19/Item Name._____ dated 10.02.2015"**

5. The printed literature and catalogue/brochure giving full technical details should be included with the technical bid to verify the specifications quoted in the tender. The bidders should submit copies of suitable documents in support of their reputation, credentials and past performance.

6. The rates should be quoted in figures (typed or printed) and cutting should be avoided. The final amount should be in figures as well as in words. If there are cuttings, they should be duly initialed, failing which the bids are liable to be rejected.

7. Any bids received after **1:00 P.M. on 3rd March, 2015** shall not be considered

8. The Technical Bids will be opened on **3rd March, 2015 at 03:30 P.M.** The date & time for opening of Financial Bids will be informed later to the technically qualified bidders.

9. While sending rates, the firm shall give an undertaking to the effect that "*the terms/conditions mentioned in the enquiry letter/Tender Notice against which the rates are being given are acceptable to the firm.*" In case the firms do not give this undertaking, their rates will not be considered.

10. If the supplier/firm is original equipment manufacturer (OEM)/authorized dealer/sole distributor of any item, the certificate to this effect should be attached.

11. The quantity shown against the item is approximate and may vary as per demand of the Institute at the time of placing order.

12. All tender documents should have to be sent through courier, speed post or registered post only. All tender documents received after the specified date and time shall not be considered.

The postal address is:

"**Assistant Registrar, Stores and Purchase"**
Indian Institute of Technology Mandi (IIT Mandi),
Administrative Block (Mandav Hotel,
Near Bus Stand), Mandi – 175001 (H.P), India"

13. In the event of any dispute or difference(s) between the vendee Institute (IIT Mandi) and the vendor(s) arising out of non-supply of material or supplies not found according to specifications or any other cause whatsoever relating to the supply or purchase order before or after the supply has been executed, shall be referred to "The Director, IIT Mandi", Kamand who may decide the matter himself or may appoint arbitrator(s) under the arbitration and conciliation Act, 1996. The decision of the arbitrator shall be final and binding on both the parties.

14. The place of arbitration and the language to be used in arbitral proceedings shall be decided by the arbitrator.

15. All disputes shall be subject to Mandi Jurisdiction only.

16. All tenders in which any of the prescribed conditions is not fulfilled or any condition is putforth by the tenderer shall be summarily rejected.

17. The bidders or their authorized representatives may also be present during the opening of the Technical Bid, if they desire so, at their own expenses.

Note: Price bids of only those bidders will be opened whose technical bids are found suitable by the committee appointed for the purpose. Date and time of opening of price bids will be decided after technical bids have been evaluated by the committee. Information in this regard will be posted on Institute's web site / Notice board. In exceptional situation, an authorized committee may negotiate price with the qualified bidder quoting the lowest price before awarding the contract.

18. Clarifications:

In case the bidder requires any clarification regarding the tender documents, they are requested to contact our office (e-mail: viswa@iitmandi.ac.in & arsp@iitmandi.ac.in) on or **before 02/03/2015**.

19. Tender Cost:

A Demand draft of **Rs. 1,000/-(Rupees One Thousand only)** towards non-refundable **tender fee, drawn in favour of "The Registrar, IIT Mandi"** payable at Mandi should accompany the Technical bid documents. In the absence of tender cost, the tender will not be accepted.

20. Earnest Money Deposit (EMD):

A refundable amount of **EMD Rs.4 Lakh** as earnest money deposit (EMD) in the shape of DD from a scheduled bank in India **(valid for a minimum period of 3 months from the date of submission of tender)** should accompany the bid documents. The DD drawn in favour of "The Registrar, IIT Mandi" payable at Mandi should accompany the bid documents. The EMD should be kept in a separate sealed envelope, should be marked clearly and put in the outer envelope that contains the technical and financial bid envelopes. The bidders should enclose a pre-receipted bill for the EMD to enable us to return the EMD of unsuccessful bidders. Failure to deposit **Earnest Money** will lead to rejection of tender.

21. Pre – Qualification Criteria:

a) Bidders should be the manufacturer/ authorized dealer. Letter of Authorization from original equipment manufacturer (OEM) on the same and specific to the tender should be enclosed.

b) An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well.

c) OEM should be internationally reputed Branded Company.

d) The Vendors who have earlier supplied the equipment to any of the IITs, IISc, IISERs and other

Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids

e) Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid.

f) Furnishing of wrong/ambiguous information in the compliance statement may lead to rejection of bid and further black listing of the bidder, if prima-facie it appears that the information in the compliance statement was given with a malafide/fraudulent intent.

22. Prices:

a) The Prices quoted should be inclusive of all taxes or duties, packing, forwarding, freight, insurance, delivery and commissioning etc. at destination site (IIT Mandi, Mandi). IIT Mandi is registered with DSIR, Govt. of India and is exempted from Custom / Excise Duty. Exemption Certificate to this effect will be issued by IIT Mandi. **Hence, Customs/Excise Duty exempted price should be quoted**. The rates shall be firm and final. Nothing extra shall be paid on any account. **In the price bid/financial bid, the vendor should clearly mention the final price breakup i.e. ex-work price/FCA price, FOB price, CIP/CIF price & FOR IIT Mandi, Kamand Campus price, as applicable in their bid.**

b) In case of imported equipment(s)/item(s), the agency commission, if any, payable in Indian rupees should be mentioned separately. For imported equipment, the Letter of Credit will be opened for the amount excluding agency commission in Indian Rupees. The firm should clearly mention the address of foreign bank in the financial bid.

23. Validity:

The bid should be valid for acceptance up to a period of 180 Days. The Bidders should be ready to extend the validity, if required without any additional financial implications.

24. Delivery:

The Equipment should be delivered and installed within the period as specified in the purchase order and be ready for use within 24 weeks of the issue of purchase order unless otherwise prescribed. If the bidder fails to deliver and place any or all the Equipments or perform the service by the specified date, penalty at the rate of 1% per week of the total order value subject to the maximum of 10% of total order value will be deducted.

25. Training:

Bidders need to provide adequate training to the nominated persons of IIT Mandi at their cost. IIT Mandi will not bear any training expenditure.

26. Warranty Declaration:

Bidders must give the comprehensive on-site warranty as required from the date of successful installation of Equipment against any manufacturing defects and also give the warranty declaration that "*everything to be supplied by us hereunder shall be free from all defects and faults in material, workmanship and shall be of the highest quality and material of the type ordered, shall be in full conformity with the specification and shall be complete enough to carry out the experiments, as specified in the tender document.*

Any deviation in the material and the specifications from the accepted terms may liable to be rejected and the bidders need to supply all the goods in the specified form to the satisfaction / specifications specified in the order / contract and demonstrate at their own cost.

27. Performance Bank Guarantee: A performance bank guarantee from a scheduled bank in India for an amount equal to 10% of the price for duration of two months beyond the expiry of warranty period will be taken from the supplier or Indian agent.

28. Terms of Payment:

Payment will generally be made only after delivery and satisfactory installation, testing, commissioning etc. **This must be specified in the tender/quotation.**

- In case of imported supplies, payment (excluding Indian agency commission, if any) will be made through irrecoverable Letter of Credit in two installments. 80 % of the money will be released on submission of shipping of documents. Remaining 20 % will be released after successful installation of the instrument and submission of a performance bank guarantee for 10% of the order value from a nationalized bank, valid for 2 months beyond the expiry of the warranty.

29. Tender expenses and documents:

All costs incurred by the bidder in the preparation of the tender shall be at the entire expense of the bidder.

30. Tender Evaluation Criteria:

The technical bids will be opened and evaluated by a duly constituted committee. After evaluation of the technical bid, the financial bid for only those offers which have qualified in the evaluation of technical bid will be opened.

31. Return of EMD:

- The earnest money of unsuccessful bidders will be returned to them without any interest within 30 working days after awarding the contract.
- The earnest money of the successful bidder will be returned to them without any interest within 30 Days after supply of material

32. Manual and documentation:

All the manuals necessary for operating and servicing the equipment (including details of electronic circuits) will have to be provided along with the instrument.

33. Bidders should go through the tender terms, conditions and specifications carefully and fill in the attached compliance statement accurately and unambiguously. They should ensure that all the required documents are furnished along with the bid.

Sd/-
Assistant Registrar
Stores & Purchase

BID PARTICULARS

1. Name of the Supplier :

2. Address of the Supplier :

3. Availability of demonstration of equipment: Yes / No

4. Tender cost enclosed: : Yes/No if yes

D.D. No._____ Bank_____ Amount_____

5. EMD enclosed : Yes / No if Yes

D.D. No._____ Bank_____

6. Name and address of the Officer/contact person to whom all references shall be made regarding this tender enquiry.

Name :

Address :

Telephone No. :

Fax No. :

Mobile No :

e-Mail :

Web :

Annexure 1

Ref:-ENQUIRYNO:-IITMANDI/Admin/PUR-148/2014-15/ Nanoindentation

The following are the TECHCNIAL SPECIFICATIONS required for **Nanoindentation:**

Items	Requirements
1.1. Mechanical Property Assessment Tests	a) Nanoindentation (both quasi-static and dynamic mode) ➢ Hardness and Elastic modulus (with depth profiling facility) ➢ Indentation creep properties ➢ Fracture toughness ➢ Bending of micro-beams and cantilevers ➢ Fatigue of micro-beams and cantilever ➢ Pull-out and push-through forces (for composites) ➢ The Nano Indentation system supplied should be compatible to dynamic indentation testing to enable dynamic measurement of contact stiffness, damping etc. Dynamic indentation testing, if it is a separate add on item, should be quoted. b) Nano-scratch and wear
1.2. Low Load Head	a) Load range: ≤ 5 µN to 10 mN or higher b) Normal Force Bit Resolution : ≤ 1 nN c) Loading rate: Up to 50 mN/sec with three orders of variation or more d) Force noise floor: ≤ 75 nN e) Compliance of loading frame: 0.1 ìm/mN or lower
1.3. Displacement	a) Indentation depth(Maximum displacement): 5 µm or more b) Normal Bit Resolution: 0.01 nm or lower c) Displacement noise Floor: ≤ 0.2 nm or lower
1.4. Force and displacement feedback control	a) Feedback loop rate: Up to 70 kHz and better b) Data acquisition rate: Up to 15 kHz and better
1.5. Sample stage specifications	a) X, Y Cartesian axes staging system b) Usable sample area in XY plane: ≥ 100 mm x 100 mm c) Z direction travel: 50 mm or more d) Positioning accuracy: 1 µm or less
1.6. High temperature sample heating stage	a) In situ nanomechanical testing at different tem-peratures ranging from RT to 800^{o}C or higher b) Temp resolution: ≤ ± 0.1^{o}C
1.7. Optical microscope	a) Optical magnification: 10X, 20X and 50X b) Digital mag.: 10X of the objective magnification or better c) Digital camera resolution: 5 Megapixel or better
1.8. Quantitative topographical imaging via scanning probe microscopy	a) Automatic positioning of the indenter for image construction b) *In situ* scanning probe microscopy preferred c) Image analysis should include 2D&3D visualizations and surface profiling d) Observation and quantification of material deformation (e.g. pile-up, wear volume, crack length and scratch morphology) incurredduring testing e) X-Y Cartesian direction scan range: at least 60 µm X 60 µm f) Z direction: at least 4 µm

	g) Resolution in X, Y and Z direction: less than 2 nm h) Imaging contact force: 100 nN or less
1.9. Scratch and wear test module (lower lateral force mode)	a) Lateral force: up to 2 mN b) Lateral force bit resolution: < 50 nN c) Max scratch length: at least 15 µm possible d) Scratch speed: 100 nm/s to 2 mm/s e) Maximum contact force for scanning: ≤ 0.1 mN
1.10. Electrical contact resistance	a) Electrical contact resistance measurement during the indentation up to maximum load of 10 mN. b) Measurement should cover large range of voltage and current with high voltage and current resolution

2. Optional Facilities	
Items	**Requirements**
2.1. Higher load mode Vendor may quote the price for combined system with both low and high load modes	➢ Maximum Force range: up to 10N ➢ Load resolution: ≤ 0.000015% of Maximum force or better ➢ Maximum indentation depth ≥ 80 µm ➢ Displacement resolution: ≤ 0.01 nm or better
2.2. Scratch and wear test	➢ Maximum lateral force: 5 N or more
2.4. Tests in fluid module (higher lateral force mode)	Carrying out indentation and scratch tests in fluid, e.g. for testing biological samples at *in vivo* condition ➢ Lateral Force Resolution: < 0.000015% of Maximum lateral force or better ➢ Lateral Displacement Resolution: ≤ 0.02 nm or better ➢ Max scratch distance: at least 3 mm possible ➢ Scratch speed: up to 5 µm/sec
2.5. Continuous or Dynamic stiffness measurement	➢ Force oscillations: at least 10 mN or less ➢ Force oscillation frequency : 1 Hz to 300 Hz ➢ Modulus Mapping
2.6. Acoustic Emission Testing	➢ Acoustic emission signals from specimen during nanoindentaion

3. Indenter:

3.1 The Nano indentation system should be capable of doing indentation and scratch testing with different indenters having varied geometries. Especially, Indentation with Berkovich indenter, cube indenter, spherical indenter, conical indenter, Vickers Indenter and flat punch indenter should be possible and the necessary option should be included in the control software.

3.2 **The following probes should be supplied with the nanoindentation system:-**

Indenter	**Low load indentation**	**Low load scratch testing**	**Higher load indentation**	**Higher load scratch testing**	**Elevated temperature**	**Tests in fluid**
	Basic items		Optional items			
Berkovich indenter	5	Nil	2	Nil	2	2
Conical Indenter	2	2	2	2	Nil	Nil
Cube corner	2					
Spherical Indenter	2					

3.3 Different probes should be quoted separately under consumables/spares for choosing them as per the requirement. Spare probes could be also quoted as package covering all the applications.

3.4 All the indenters should be supplied with a certificate, having details of probe material, geometry

and area function details of the probes.

4. Scratch Testing:

4.1 Scratch testing must be possible in both constant load mode and in ramp up load mode by the nanoindentation system
4.2 Scratch capability must be in both forward and backward motion in both X and Y Cartesian directions.
4.3 Suitable imaging options should be provided to cover the entire scratch lengths obtained during scratch testing.
4.4 Post-scan and pre-scan options for topography scanning should be available with the scratch testing mode.
4.5 The control software should have necessary options to obtain and to plot variation in Lateral force Co-efficient of friction with respect to scratch length during scratch testing.

5. Instrumentation:

5.1 The power supply conditions of input voltage for the nanoindentation system must be 220-230 V AC, single phase, frequency-50Hz.
5.2 The Nanoindentation system must be supplied with environmental isolation chamber and damping system (frequency range from 1.0 to 200 Hz or better) for minimizing the temperature variation, vibrations, ambient acoustic noise and air currents. Vibration isolation system should exhibit no low frequency resonance.
5.3 The required specifications can be met through a single integrated system or through a combination of accessories and both are acceptable.

6. Software:

6.1 The vendor should supply a latest version, user friendly software that works on windows operating system (Windows 7 and above) for controlling the instrument, calibration, data acquisition, and post processing of the measured data with 2 additional licenses. Vendor may quote the price for the each additional license.
6.2 The required number of industrial processing unit for controlling the Nano indentation System should be provided with the nanoindentation system with minimum requirements as specified below :
6.3 4GB RAM Memory, Core i5 processor, 1TB HD, DVD RW, 19" or 20" LCD Monitor.
6.4 Suitable UPS to run all kinds of nanoindentation experiments and analysis for 1 hour back up *(optional item).*
6.5 Instrument compliance and thermal drift corrections, tip calibration should be possible by the control software supplied with the nanoindentation system.
6.6 The software should be capable of multiple file analysis with export of calculated data to text and excel file.
6.7 Comparison of estimated mechanical properties with respect to depth from multiple samples should be possible.

7. Reference samples and accessories:

7.1 All the necessary accessories required for high temperature testing (*optional item*) should be supplied with nanoindentation system. Any consumable, if required for high temperature testing should be quoted separately under Consumables/Spares. The supplier should provide the list of accessories required for smooth running of the machine for 3-5 years and should quote all the necessary accessories.
7.2 The vendor has to supply the required standard reference samples, at least two different materials, with certificates, along with the nanoindentation system. Reference samples required for scratch testing should also be supplied along with certificate. Vendor should provide at least 4 aluminum standards.
7.3 Any special fixture or chucks required for sample holding should be supplied.
7.4 Required adapters, fasters, cables peripherals, attachments, spares, etc for the successful installation and maintenance of Nano indentation system has to be provided by the vendor.
7.5 The manuals pertaining to Nano indentation system, i.e. maintenance and user manuals to be provided along with the Nano indentation system.
7.6

8. General technical terms and condition

Installation requisites:

All the prerequisites for installation have to be quoted. Institute will only provide electricity at 220V, 50Hz, normal quality water and space. The vendor has to submit pre-installation site requirements/guidelines for the nanoindentation system along with the technical bid. Vendor also should quote for suitable UPS and other needed accessories.

Installation and training

Two installations (i.e., first time at IIT Mandi, Mandi campus and second time at Kamand campus) will be done by the supplier and it should be included in the estimated cost. On-site 4 days training for operation and application may be given to the users for free of cost. IIT Mandi will not bear any training or leaving expenditure in this regard.

Warranty and maintenance:

The complete instrument should be under warranty for a period of at least one year from the date of installation. Additional cost, if any for extended warranty of three years may be quoted for all the hardware and software (other than the consumables) of the nanoindentation system has to be included in the price quotation.

The nanoindentation system provider vendor must have service center in India. In case of breakdown during the warranty period, a competent service engineer of the supplier should make as many visits as are necessary to rectify the problem and replace the faulty parts, without any liability of cost. But it should be repaired within 72 working hours from the date and time of complaint lodged by the user. Supplier should ensure to provide all spares required for making the instrument operational. The spares recommended for keeping in inventory along with the instrument may also be quoted.

Annual maintenance contract

The vendor should be agreeable to enter into Comprehensive Annual Maintenance Contract with IIT Mandi at a reasonable price, for maintaining the equipment in proper working conditions, after the warranty period is completed. Quote the cost of onsite annual maintenance for two years after warranty period.

Spare parts

The supplier of the instrument must confirm in writing that the spares for the entire instrument will be available for a period of at least ten years after the model of equipment supplied has been phased out. For frequently required spares, there should be adequate inventory with the Indian agency.

Manual

One set of operating manual and service manual including detailed drawings and circuit diagrams (in English) should be provided with the instrument.

User list with contacts

Vendor should specify the exact quoted model number and provide the user list in India along with contact details so that IIT Mandi can approach the contact person for any feedback. In case of any doubt about capability of the machine, the vendor will have to arrange demonstration at any site bearing the cost including the travel and other expanses of IIT Mandi representative.

Compliance Statement

The supplier must submit technical brochures and proper application notes adequately explaining and confirming the availability of the features in the model of the equipment being quoted. The supplier must submit a table indicating the compliance of the features of the model of the equipment being quoted with those given in the indent. Features not matching – must be clearly indicated. Additional features in the quoted equipment which are better than those in the indent – may be clearly explained.

The vendor may certify that the equipment and accessories quoted provide a complete package for use of Nanoindentaion with all the intended features/accessories.

COMPLIANCE STATEMENT FOR THE TENDER SPECIFICATIONS

INDIAN INSTITUTE OF TECHNOLOGY MANDI HIMACHAL PRADESH-175001

Ref:-ENQUIRY NO:-**IITMANDI/Admin/PUR-148/2014-15/ Nanoindentation**

Instructions

1. You have to fill in all columns and ensure that you furnish all the required information accurately and unambiguously.
2. If our specification contains any values, you have to provide your values against the column in the same unit as we have specified.
3. Deviation in values, materials etc. from our specification may be explained in the remarks column

S. NO	**Check list of documents/ Undertakings ?**	**YES/ NO**	**Remarks (Give explanation if answer is No)**
1	Is Tender fees attached?		
2	Is EMD attached? (if applicable)		
3	Is the bidder original equipment manufacturer (OEM)/authorised dealer?		
4	If authorised dealer, recent dated certificate to this effect from OEM, attached or not?		
5	Undertaking from OEM regarding technical support & extended warranty period		
6	Validity of 180 days or not?		
7	Undertaking from bidder regarding acceptance of tender terms & conditions		
8	Whether list of reputed users (along with telephone numbers of contact persons) for the past three years specific to the instrument attached.		
9	Whether special educational discount for Indian Institute of Technology (IIT) Mandi (H.P) given.		
10	Whether two weeks training of operator and research students without any charges offered.		
11	**Does the instrument complies with all the specifications from S. no. 1 to 8 Attach a separate sheet showing compliance with the specifications and explanations thereto if the equipments varies from the requested specifications.**		
12	Whether free Installation, Commissioning and Application Training offered.		
13	Whether Three years comprehensive onsite extended warranty offered.		
14	Whether Annual maintenance after expiry of comprehensive onsite warranty quoted separately as optional.		