



**TENDER NOTICE  
FOR THE PURCHASE OF X-RAY DIFFRACTOMETER (XRD)  
INSTRUMENT**

1	Last date for submission of tender	26.08.2016
2	Date of opening of tender	Next working day at about 11.00 a.m from the closing date
3	Earnest Money deposit	2 % of the total cost
4	Security Deposit	5% of order value (before placing the PO)
5	Tender Fees (non – refundable)	Rs. 5,000/- <b>Cheque or D/D in favour of “SICART- CVM”</b>

**Tender Document Contains:**

- I. Specifications
- II. General Terms & Condition
- III. Appendix

**Dr. A. R. Jani**  
**Hon. Director**  
**SICART**  
**CHARUTAR VIDYA MANDAL**  
**VALLABH VIDYANAGAR – 388120**  
**Dist: ANAND, GUJARAT**  
**(02692- 234966), (F) 02692- 238355**

**SOPHISTICATED INSTRUMENTATION CENTRE  
FOR APPLIED RESEARCH & TESTING (SICART)**  
(Sponsored by Department of Science & Technology, Govt. of India, New Delhi)  
NABL Accredited laboratory, Certificate No.T-3243  
**SARDAR PATEL CENTRE FOR SCIENCE & TECHNOLOGY**  
**CHARUTAR VIDYA MANDAL, VALLABH VIDYANAGAR - 388120**  
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**TENDER DOCUMENT FOR THE PURCHASE  
OF  
X-RAY DIFFRACTOMETER (XRD) INSTRUMENT**

Dr. A. R. Jani  
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**Email: sicart\_cvm@hotmail.com, Website: www.sicart.res.in**

## **TENDER NOTICE**

Seal item rate tenders are invited from reputed and established manufacturers or authorized dealers for the supply, installation, testing and commissioning of **XRD Instrument** & accessories having below specifications:

**TECHNICAL SPECIFICATION:** The instrument shall conform to the requirements of the specification including spares, accessories, and consumables as mention below in Part – A while Part - B is for other terms and conditions:

### **PART – A**

❖ **Scope:**

Supply, installation and performance demonstration of floor mounted, fully automated **Powder X-Ray Diffraction (XRD) System** with Grazing Incidence Thin Film Analysis attachments and SAXS measurement with necessary hardware and software.

**System should be capable to characterize in following modes / modules.**

1. XRD in Theta-Theta / Theta-2Theta mode, Qualitative and Quantitative studies.
2. Reflection and Transmission setup.
3. Reiteveld refinement structure determination.
4. Grazing Incidence Diffraction (GIXRD) Setup/mode for polycrystalline Thin Film measurement.
5. Small angle X-Ray Scattering Studies.
6. Pole Figure attachment with necessary software.

For the said purpose offers are invited from the reputed manufacturers / Representatives for supply, installation and commissioning of XRD system. The system should meet minimum all the technical requirements as detailed below. The higher / advanced version of any specification will be considered.

## 1.0 Technical Specifications:

Sr. No.	Specifications	Detail
1	Basic System configuration	An integrated system inclusive of X-Ray source, Generator, Primary & Secondary optics, Goniometer, Sample stage and detector assembled in suitable radiation shielded cabinet. The detailed specifications of individual modules shall comply with following requirements.
2	X-Ray Generator	(a) 3 KW Generator with up to 50 kV voltages and 60 mA Current. (b) Efficiency should be better than 85 %. (c) Input power should be single phase 220V $\pm 10\%$ , 50-60 Hz (d) Stability :< 0.005% for high voltage and current with 10% variation of main supply.
3	X-Ray Tube	(a) 2.2 kW or more, Cu Anode , Ceramic insulated body (b) The tube should be facilitated to rotate between line & point focus without de-attaching the HV cable and water chiller line. It has to be convertible into point focus should not attenuated. (c) Other X-Ray source Mo & Ag should be quoted in option.
4	Goniometer	(a) Two-circle, Vertical Goniometer with Theta-2 Theta geometry (b) The minimum step size: $0.0001^\circ 2\theta$ or lower. (c) Angular reproducibility $\pm 0.0005^\circ 2\theta$ or better. (d) $2\theta$ Angular range : $-90^\circ < 2\theta < 165^\circ$ or better (e) Goniometer diameter : $450 \text{ mm} \leq \phi \leq 600 \text{ mm}$ (f) Peak position accuracy(Angular Linearity) should be $\pm 0.01^\circ$ for entire $2\theta$ range on NIST standard sample
5	Optics	(a) Necessary divergence slit. (b) Necessary Antiscater & Soller Slits. (c) Ni filters for Cu tube. (d) All necessary slits, filters, and optics systems to be included in the system for all the applications.
6	Sample Stage	(a) Reflection Transmission Spinning sample stage. (b) Rotation speed selectable by software up to 100 rpm. (c) Necessary sample holder – 20 Nos. (d) Zero back ground sample holder with flat single crystal- 3 Nos.

7	Detector	<ul style="list-style-type: none"> <li>(a) Latest solid state array detector / LynxEye detector</li> <li>(b) Active area : <math>\geq 14 \text{ mm} \times 14 \text{ mm}</math> or larger</li> <li>(c) Angular coverage: <math>\sim 3.0^\circ</math> at approx. 480 mm dia.</li> <li>(d) Single detector capable to perform 0D, 1D &amp; 2D functional mode. In 2D (Area detector) mode should have the capability to generate the data in form of Debye Scherer rings and convert the same to normal diffractograms.</li> <li>(e) Count rate : <math>&gt; 100,000,000 \text{ cps}</math></li> <li>(f) Number of strip/ pixel : 160 or higher</li> <li>(g) Spatial resolution: <math>\leq 75 \mu\text{m}</math></li> <li>(h) Detector should be capable to work all the characteristics radiation like Cu, Cr, Co, Mo &amp; Ag.</li> <li>(i) Detector should have energy dispersive type or should have a capability to removal of fluorescent background along with suitable optics or a secondary diffracted beam Monochromator (curved single crystal Graphite) which should be quoted along with the detector.</li> <li>(j) Efficiency of the detector should be <math>\geq 97\%</math> for Cu radiation.</li> <li>(k) Detector should not use any external cooling or gas for operations.</li> </ul>
8	Electronics	<ul style="list-style-type: none"> <li>(a) The system electronics should have an integrated shutter control and be capable of monitoring and controlling all Diffractometer functions such as angles, counts, slits, generator safety, etc.</li> </ul>
9	Computer	<ul style="list-style-type: none"> <li>(a) A desk top PC should be provided for all operations of the XRD with minimum Core i5 or higher processor, 8x DVD-RW drive facility, &gt;500 GB HDD, &gt;4 GB DDR RAM, 21" LCD Monitor, Minimum 9 USB drives, Windows operating system.</li> <li>(b) A color laser printer shall be provided for graphic work.</li> </ul>

10	Software	<p>(a) The software should be capable of simultaneous Diffractometer control, data collection and analysis, peak search, search-match, and elaborate pattern treatment such as data smoothing, background subtraction, <math>K\alpha_2</math> stripping, crystallinity determination etc.</p> <p>(b) Crystallographic and Rietveld based quantitative phase analysis software which should cover:</p> <ul style="list-style-type: none"> <li>• Qualitative analysis</li> <li>• Phase quantification</li> <li>• Peak/Line Profile analysis</li> <li>• Lattice parameter determination</li> <li>• Crystallite size determination</li> <li>• Percentage of Crystallinity determination</li> <li>• Phase quantification based on Rietveld method</li> <li>• Unit Cell determination</li> <li>• Space Group determination</li> <li>• Electron density Fourier Mapping</li> <li>• Ab-initio Structure determination Method</li> </ul> <p>(c) Software for grazing incidence X-ray diffraction analysis,</p> <p>(d) Software for SAXS studies.</p> <p>(e) Licensed ICDD PDF2 and ICSD database, PDF4+, PDF4/Organics, PDF4/Minerals, Crystallography Open Database; licensed should be in the name of SICART for the entire database library.</p>
11	Hardware for GID	<p>(a) Parabolic multilayer graded mirror 60mm or more</p> <p>(b) Equatorial Soller collimator</p> <p>(c) Necessary sample stage –sample direction horizontal mount.</p>
12	Hardware for SAXS studies	<p>(a) Parabolic multilayer graded mirror 60mm or more</p> <p>(b) Capillary sample stage for transmission.</p> <p>(c) Necessary software for SAXS measurement.</p>
13	Calibration Standard	<p>(a) NIST Standard Reference Material</p>

14	Safety	<p>(a) As per the highest international standards and regulations, fully X-ray protected enclosure safety system is essential-ray protected enclosure as per international safety norms and CE certified, EC declaration of conformity certificates is essential and should provide along with system.</p> <p>(b) The X-ray leak rate should be <math>&lt; 1 \mu\text{Sv/hr}</math> which should be measured and certified by the supplier.</p> <p>(c) Leak current breaker</p> <p>(d) Shutter malfunction detection</p> <p>(e) Any other safety requirement which supplier feels essential &amp; necessary and not covered above may be included in the scope of supply.</p>
15	Installation qualification, Operational qualification, Procedure qualification (IQ,OQ,PQ)	As per NABL (ISO-IEC 17025), IQ, OQ, PQ documentation is required at the time of installation of the instrument.
16	Warranty	Five Years (The Spares and support from the supplier should be available for 07 or more years after warranty).
17	Water Chiller	Suitable close loop chiller to cool the X-ray sources & Generator. The chiller should be able to work in Indian ambient temperature environment i.e. up to 46°C.
18	UPS	Minimum 20 KVA on line branded appropriate UPS to run XRD system with 40 minutes back up.
19	Manual	2 set of Operation and maintenance manuals in English language should be supply along with system.
20	Performance Guarantee	System should be guaranteed for auto alignment accuracy. The accuracy of each peak position should be equal or better than $\pm 0.01^\circ$ (2Theta) over the whole angular range based on the internationally accepted Standard Reference Material by NIST.
21	Training	Necessary training to 3 person of SICART staff on Operation, Maintenance, Calibration of the offered system and X-ray diffraction studies will have to be provided at customer's site and Company's Application centre.
22	After Sales Service Support	The vendor offering the required XRD system should have their service centre in India preferably in Gujarat / Maharashtra such that the engineer can attend any service call within 48 hours.
23	Essential Spares and Consumables	<p>Tool kit with all mechanical tools and accessories for the system installation and regular operation should be provided.</p> <p>Necessary spares and consumables required for smooth and efficient operation of X-ray Generator and goniometer for 5 years should be quoted.</p>

## PART – B

### ♣ GENERAL CONCILIATIONS OF SUPPLY:

1. The instrument and all its sub units should operate on 230 ±10 volts 50 Hz power supply.
2. All the operation and maintenance manuals, circuit diagrams, application notes and application software to be supplied should be in English language.
3. The supplier/ manufacturer shall have to arrange for after sales service as well as O & M through their Indian agent/ representative to be specifically nominated in their bid proposal. However, the purchaser will place a single order in the name of bidder and no separate order in the name of the Indian Representative/ Agent will be placed for after sales/ O & M service.
4. The main unit and all the sub units of the instrument should be serviced by the Indian representative supplier.
5. Bidders shall invariably furnish documentary evidence in the form of client's certificate In support of satisfactory supply and operation of the equipment as mentioned in the qualification requirement.
6. Notwithstanding anything stated above the purchaser reserves the right to assess the capability and capacity of the bidder to perform the contract, should the circumstances warrant such as assessment in the overall interest of the purchaser.
7. Comprehensive warranty with free of cost supply of spares for 05 years from the date of successful commissioning of the instrument should be covered. Also, after five years warranty, extended warranty up to 2 years to be covered separately.
8. The maximum down time period for repairs of the equipment shall be 72 hours from the date of notification by the purchaser to the bidder/supplier.
  - Installation of the instrument and performance demonstration must be made at site.
  - Onsite warranty at least for five years after the date of satisfactory installation.
  - Two weeks training for at least two persons at site for learning the basic operations.
  - Invoice should have the costing of each unit /component of **XRD Instrument** separately.
  - Principal should submit the compliance certificate at the time of installation.

(9) General Points:



## SUPPLIERS PARTICULAR

Name of the firm :

Whether sole Proprietor Partnership/  
Pvt. Ltd/Public Ltd under Indian  
Company's Act, 1956. With copy of  
Partnership Public Ltd., Regn. Certificate. :

Name of sole Proprietor or managing  
Partners or Managing Director and other  
Directors with addresses, telephone  
Numbers and Email IDs :

Details of registered office and other  
Regional Offices

Contact persons for matters as regards  
The present contract(Legal authority may  
be cited) :

## APPENDIX – I

### INFORMATION TO BE PROVIDED BY THE SUPPLIER / INDIAN REPRESENTATIVE OF FOREIGN CO. WITH THE QUOTATION

1. Details of the infrastructural requirements (including glassware, chemicals and gases & standard)s for the installation of the system being offered.
2. Details of the sales/service facilities.
  - (a) Location of the sales/service facilities.
  - (b) Number of the Service Engineer at each center with their existing servicing load (in terms of the number of units being serviced.)
  - (c) List of details of the spaces which are available (in case of foreign manufacturers only) with the Indian representative for providing quick maintenance of the unit.
3. Details of the training facilities available.
  - (a) Location of centers
  - (b) Types of the training programmers offered with syllabus.
  - (c) Details of training aids available
  - (d) Charges for training programme
4. Details information about the application lab facilities available -----
5. Information about the development of the system
  - (a) Year of introduction and expected life of the model being offered
  - (b) Expected year in which the model being offered will be out of production.
6. Any other information the tenderer wished to supply
7. Details about the organization in India where similar unit / Instrument is supplied and is in working condition.

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**Email:** sicart\_cvm@hotmail.com, **Website:** www.sicart.res.in

**General Terms and Conditions**

1.0 The rates should be quoted for each item, stating the specific Brand / Make / Model no. etc. with taxes. The bidder must quote for the equipment in accordance with the specifications mentioned in the tender document which is forming a part of the contract.

The bidders, nevertheless, may submit the offer for similar equipment under the head "option:" and quote separately for such similar equipments or accessories. The price may also be quoted in foreign currency i.e Dollar, Pound, Euro etc. by authorized representatives of imported equipment.

2.0 The rates should be inclusive of all taxes FOR destination at the institute and should be quoted in the following format.

2.1 Basic prices of the Unit -----

2.2 Price of necessary accessories / spares / chemicals / glassware's etc. with detailed specifications to be supplied with basic unit and for optional.

2.3 Taxes

- CST - \_\_\_\_\_  
- ST - \_\_\_\_\_  
- Octroi - \_\_\_\_\_

2.4 Packing and Forwarding \_\_\_\_\_

2.5 Mode of Transport for (Delivery at Vallabh Vidyanagar, Dist: Anand in Gujarat) \_\_\_\_\_

2.6 Installation and Commissioning & Training \_\_\_\_\_

2.7 Total

2.8 The total price for each item as delivered in 2.7 above should be quoted in bill of material.

3.0 The Purchaser being educational institute, the concessions applicable in rates / taxes under State / Central Government notification should be considered while quoting. The institution can not issue C & D Forms / Certificates which may please be noted. The institution can, however, issue a certificate that the equipment being procured would be used exclusively for teaching / research purposes.

4.0 Conditional tender shall not be accepted.

In case of the authorized dealers quoting on behalf of manufacturers, a copy of certificate stating that the equipment is being quoted by the party is on behalf of the concerned manufacturer and manufacturer undertake the responsibility to provide the after sales maintenance of the equipment.

- 5.0 The supplier should clearly state the delivery period and time period required for installation and commissioning of the equipment, from the date of receipt of firm order. But it should be 12 weeks from the date of opening of the LC (8 weeks from the date of the purchase order for Indian suppliers). In case, if supplier anticipates delay in delivery of any or all items due to the reasons beyond his control, the supplier shall apply for suitable extension stating the reason for the same and state its confirm date of delivery. The purchaser, if feels suitable may extend the delivery date.
- 6.0 In case of delay of delivery of the equipment beyond the stipulated period, a penalty of 5% (Five Percent) of the total value of the ordered equipment will levied for each of delay or part thereof. The maximum penalty however shall not exceed 25% of the ordered value.
- 7.0 The supplier or the Indian representative should install the system and bring in to complete operation, at Vallabh Vidyanagar in Gujarat on a location of the purchaser's choice and to satisfaction, without any charge.
- 8.0 The supplier or the Indian representative should give performance warranty for (i) the Complete system for five years from the date of the completion of the satisfactory installation and commissioning (ii) list of critical and non critical spares (iii) and service back up including commitment for the availability of the spares, of the system for a period of minimum 07 years from the date of installation. Also in case of equipment going out of production, at least two years advance notice should be given to enable, one time procurement of the spares
- 9.0 Demonstration and training for operators of all modules. This should include (besides standard samples,) the satisfactory analysis of at least (5) SICART samples carried out by SICART Scientists. Minimum four training may be provided, three at our site and one at your application center until the user satisfy with training.
- 10.0 The supplier shall arrange for repair / replace the defective / worn out components, of the equipment at our place during the guarantee period at purchaser's first instructions within 10 (Ten) days. This will be carried out at the cost of supplier and no charges whatsoever will be paid including the T.A and D.A of the service engineer for the same.
- 11.0 In the event of material supplied are not being in accordance to the specifications of items ordered, the supplier will bear the cost and risk, arrange to replace the same without any claims whatsoever for the same.
- 12.0 In case the quoted rates are as per the valid and prevailing contract with DGS and D, New Delhi, the supplier shall furnish certified photocopy of the same to the purchaser. It may also be mentioned whether supplier can accept a direct order based on DGS and D rate Contract.
- 13.0 The tender, as quoted once shall be considered final. No change, alterations and modifications shall as permitted at a later stage. Incomplete tenders will be rejected without assigning any reason thereof.

- 14.0 The supplier shall provide user's list and the certificates of satisfactory operation / compliance certificate of the equipment from few organizations to whom the similar equipment has been supplied in the recent past preferably in the Gujarat region.
- 15.0 The validity of the tender may be kept open for a minimum period of 270 days after the receipt of the quotation.
- 16.0 **The earnest money:** The tender copy dully filed in must accompany a Crossed Demand Draft for 2% of the total cost in favor of "**SICART - CVM**" payable at **Vallabh Vidyanagar/ Anand**. This money shall be refunded to the unsuccessful dealer, as far as possible within 60 days from the date of the opening of the tenders; no interest shall be paid on earnest money deposited. Any offer received without the EMD shall stand wholly rejected. Nevertheless, Chairman CVM's decision on such matter shall remain final and binding.
- 17.0 The supplier shall provide both technical service manual and operation / installation manual along with the dust cover for the equipment free of cost.
- 18.0 Payment
- 1 Advance payment will not be made.
  - 2 70% of the total amount will be paid on supply of equipment after checking for specifications and installation and successful commissioning of the equipment. In a case where the equipment has not been found in conformity of the specifications as per the final purchase order, the same shall stand rejected. No case of any kind thereof should be paid by the owner
  - 3 25% of the amount will be paid after 3 months from the date of installation and successful operation of the equipment.
  - 4 Remaining 5% of the amount will be paid after the guarantee period. Any request for balance payment against Bank guarantee shall not be accepted.
- 19.0 The supplier will be required to get instrument serviced twice in a year for its Satisfactory operation during the guarantee period of five years. Necessary calibration of the instrument will be done by the supplier as and when required. Separate rates for the calibration shall be quoted along with the period of calibration required.
- 20.0 The chairman of CVM reserves all the rights to increase or decrease the quantity of or split of the items of the tender at any time while finalization of the award.
- 21.0 The chairman also reserves the right to reject any or all of tenders without assigning Any reasons thereof.
- 22.0 In case of any dispute the Jurisdiction shall be ANAND.
- 23.0 The tender for equipment must be sent in sealed envelope with the Superscription "**TENDER FOR XRD INSTRUMENT FOR SICART**" and addressed to Hon. Director, SICART, Vallabh Vidyanagar-388120, Dist: Anand (Gujarat)

- 24.0 Tenders received late shall not be accepted. All tenders shall be opened in presence of the bidders in the office of SICART in accordance with the date & time specified in the tender notice. The tenders will be opened on next working day at about 11.00 a.m from the closing date.
- 25.0 Additional information per appendix-I should be provided along with the tender.
- 26.0 Please also certify in the quotation that the price quoted are as laid down in the Manufacturers/sole distributor's price list.
- 27.0 Any special discount for educations/research institution should be specified.
- 28.0 The manufactures printed leaflet, technical literature of specifications of every item quoted should be accompanied with the quotation failing which quotations will be Summarily rejected.
- 29.0 Pre- installation requirements such as power requirement (single phase or three phase, Power load) Cooling water supply, air compressor ,air condition machine etc if any) should be provided and specify.
- 30.0 In case of items costing more than 1.0 lakh, firm whose quotation shall be accepted, shall have to give an affidavit/declaration on non-judicial stamp paper, to be signed before competent magistrate for installation, free warrantee service during warranty period, for assurance for the supply of spare parts, components on payment basis and also for refund or adjustment of payment against advanced payment made.
- 31.0 (a) In case of imported instruments the dealers will be required to deposit Rs. 1 lakh or 5% value of the order (Whichever is more) with SICART before order is placed to the Dealers and before opening of irrevocable L/C. This amount is to be held as security deposit without any interest. The amount will be refunded without interest to Dealers as and when instruments are satisfactory installed and demonstrated as per specifications and on receipt of all the service manuals.
- (b) A performance Bank guarantee of 5% value of the instrument/equipment is to be given, valid for two years as per the format provided.

## 32.0 FORFEITURE OF SECURITY DEPOSIT CLAUSE FOR IMPORTED ITEMS

1. No change in items and conditions of dealer's will be permitted once the L/C is opened. If due to a default on the dealer's part the L/C lapses or is to be cancelled, than the security deposit of the dealer will be forfeited, in addition to it the dealer will be liable for payment of excess amount (more than the security deposit) spent on opening of the L/C.
2. If the imported instrument is not installed properly within the stipulated time and/or the service manuals are not provided within the stipulated time, the security deposit will be forfeited.

- 33.0 No correspondence queries or reminders or personal visits regarding quotation position or ordering action will be entertained or replied. Orders when finalized will be intimated to the parties concerned ONLY.
- 34.0 Before placing the orders, we may ask the dealers/ suppliers to give us the demonstration of their equipment/instrument at their factory or other laboratories. They have to make all the necessary arrangements for the same.

Note : 1. The tender may be accompanied with an undertaking from the party/supplier that the terms and conditions of the tender are accepted to and binding on the Party/supplier.

2. Please return this copy of terms and conditions duly signed and stamped along with the tender documents.

Name of the Supplier:

Signature of the Supplier :

Office Stamp :