

**SOPHISTICATED ANALYTICAL INSTRUMENTATION FACILITY (SAIF)**

**&**

**CENTRAL INSTRUMENTATION LABORATORY (CIL)**

**PANJAB UNIVERSITY, CHANDIGARH**

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**TENDER DOCUMENT FOR THE PURCHASE OF  
Small Angle X-ray Scattering System ( SAXS)**

**Last Date for Receipt of Tender: 10 October, 2016 4:00 PM**

**DATE & TIME OF OPENING: To be notified later**

**PRICE Rs. 1000/-**

## SECTION – I

### PROCEDURE FOR SUBMISSION OF BIDS

1. There will be **Two bid system** for this Tender: *Techno-Commercial bid* and *Financial bid*
2. The Techno-Commercial Bid of the Tender should be covered in one sealed cover superscribing the words “Techno-Commercial Bid”.

Likewise, the Financial Bid should also be covered in a **separate** sealed cover superscribing the words “Financial Bid”.

**The two documents viz., Techno-Commercial bid and Financial bid covers prepared as above should be enclosed in a single sealed cover marked as under:**

Tender for the supply of SAXS  
Due on ..... (last date for submission).  
Name & Address of the Tenderer.....

**Note: Price should not be indicated in the Techno-Commercial bid otherwise the Tender will be rejected**

3. Tenders received after the due date will not be accepted. If the last date for submission of Tender falls on any declared holiday in the University, the next working day will be considered as the last date for the same.
4. The bids prepared by the Tenderer and all correspondence and documents relating to the bids, shall be written in English language
5. The contract for the supply of the items is non-transferable.
6. Tender/Offer should be type written, otherwise the same will be rejected
7. Each page of the tender document should be signed by the authorized signatory.
8. Each offer should be complete in all respects.
9. Telegraphic/electronic/conditional offers will not be accepted.

## SECTION – II

### TERMS AND CONDITIONS

1. **Opening of bids:** Techno-Commercial bids will be opened by the Committee after the closing date and studied. The Tenderers will be invited for presentation and clarifications if needed. Financial bids of the Tenderers complying with the prescribed Techno-commercial specifications will be opened by the Committee. Tenderers or their authorized agents may be present if they so desire during opening of the Tenders.
2. **Rejection of bids:** The Committee reserves the right to reject any or all offers without assigning any reason.
3. **EMD:** The Tender bid should accompany an EMD of minimum 2% of total value. The EMD should be made by means of an A/c payee DD in favour of the *Director CIL, Panjab University, Chandigarh-160014* payable at Chandigarh. No interest is payable on EMD.
4. **Refund of EMD:** The EMD will be returned to unsuccessful Tenderer only after the Tenders are finalized. In case of successful Tenderer, it will be retained till the successful and complete installation of the equipment.
5. **CIF value and comparison of financial bids:** CIF value up to SAIF, Panjab University, Chandigarh (*shipment by air up to Delhi and insured up to the installation site*) should be quoted. and will be considered for comparison of bids. Bids quoted in foreign currency will be converted into Indian Currency at the exchange rate applicable on the day of opening of the financial bids for comparison purposes.
6. **Warranty Period:** The warranty period should be *five years (with spares)* from the date of installation with satisfactory performance as per specifications.
7. **PBG:** Tenderer selected for supply of equipment, will have to provide Performance Bank Guarantee (PBG) on any *scheduled bank situated in India, equivalent to 10 percent of the cost of the equipment* which should be valid until the expiry of the Warranty period. The PBG will be provided by the Company along with the letter of acceptance of the order by the Principals. LC will be opened in favor of the Principals only after obtaining the PBG.
8. **Terms of Payment:** LC will be opened for the 100% value of the equipment, 90% of the amount will be released after the shipment and remaining 10% after the installation of the equipment.
9. **Delivery period :** Delivery should be made within *120 days* of opening of the LC

10. **Delayed delivery:** If the delivery is not made within the due date for any reason, the Committee will have the right to impose penalty as under:
  - i First extension for one month or part thereof @ 2%.
  - ii Second extension for an additional month or part thereof @ 3%
11. **Non delivery beyond extended period:** If the Tenderer fails to execute the order within the second extension mentioned above or mutually agreed time frame, the order will be cancelled and EMD forfeited by the Dept. He will also be liable for all damages imposed by SAIF for non supply of equipment including the liability to pay the difference between the price accepted by him and those ultimately paid by the SAIF for the equipment, Such damages will be assessed by the Committee for the purchase of SAXS .
12. Increased statutory levies and duties above the rate quoted in the offer will not be an excuse for the Tenderer to delay the supply beyond the date specified in the Tender.
13. **Validity of rates:** Rates quoted should be valid for at least *4 months* from the closing date of the tenders.
14. **Consistent pricing:** The rates quoted for the Equipments by the supplier shall in no case exceed the lowest price at which the supplier of this Equipments of identical description made to any other person/organization/Institution during the above said period and should attach an undertaking in this regard
15. **Installation requirements:** The Supplier will clearly mention installation requirements on our part in the *Techno-Commercial bid*.
16. **Installation time:** The company must install the equipment *within a period of two months* of the date of delivery of the equipment at SAIF. Chandigarh.
17. **Free Installation:** The equipment and software should be installed and tested to the specifications *free of cost*.
18. **Supporting Equipment:** The Tenderer will provide all requisite supporting equipments like isolation transformer, step down transformer, *if needed*. We need the complete installed system.
19. **Licensed Software and its up gradation:** *Ten user licenses* for analysis software should be provided. The certified/licensed software and programs should be the part of the supplies. There should be *free up gradation of software upto 10 years*
20. **Factory Acceptance Data:** Proposed acceptance criteria for the equipment should be provided by the supplier. in order to compare the performance against the quoted specifications. *Manufacturer's test certificate along with test conditions and results* is to be supplied along with the equipment.

21. Tenderers are advised to study all technical aspects and terms & Conditions, of the Tender documents. Submission of Tender shall be deemed to have been done after careful study and examination of the Tender Document with understanding of its implications.
22. **Only Manufacturers or Authorized dealers to bid:** The offering firm should clearly mention whether they are the manufacturer or authorized agent/dealer of the manufacturer. In case of agent for overseas manufacturer, a letter of authorization from the manufacturer should be submitted along with the offer. The Tenderer can also enclose the rates on the letterhead of the manufacturer if he has been authorized to do so by the manufacturer.
23. **Descriptive literature:** A set of specifications, description and illustrated literature of the equipment and related peripherals *should accompany the Techno-Commercial bid.*
24. **User and Service Manuals:** A set of User's manuals and Service manuals of the main instrument, attachments and related equipment (water chiller etc.) should be supplied with the equipment
25. **Equipment must be new:** The Tenderer must ensure that the equipment being offered is a new one and not refurbished or repaired one.
26. **Defective Equipment:** If any of the equipment supplied by the Tenderer is found to be substandard, refurbished, unmerchantable or not in accordance with the description /specification or otherwise faulty, the committee will have the right to reject the equipment or its part. The prices of such equipment shall be refunded by the Tenderer with 18% interest if such payment for such equipment has already been made to him.
27. All damaged or unapproved goods shall be returned at suppliers cost and risk and the incidental expenses incurred thereon shall be recovered from the supplier. Defective part in equipment, if found before installation and/or during warranty period, shall be replaced within 45 days on receipt of the intimation from this office at the cost and risk of supplier including all other charges.
28. **Damage during transit:** In case of any mishappening /damage to equipment and supplies during the carriage of supplies from the origin of equipment to the installation site, the supplier has to replace it with new equipment/supplies immediately at his own risk. Supplier will settle his claim with the insurance company as per his convenience. The SAIF will not be liable to any type of losses in any form.
29. **Legal jurisdiction:** Any dispute in this regard of any term of the offer and on the supply of equipment is subject to *Chandigarh jurisdiction only.*

30. **Training** Four weeks training should be provided free of charge at the premises of SAIF out of which one week should be on equipment usage & software and three weeks in maintenance twice over a span of one year.
31. **Availability of Spares:** The Tenderer must assure the availability of spares for servicing of equipment *for at least 10 years*. Supplier should give an undertaking that spares parts will be supplied within the specified periods as and when ordered.
32. **SAIF Infrastructure:** SAIF will provide required air conditioned space, *single phase power supply* with required electricity outlets.
33. **Clearance:** The Principals will do all types of clearance work to deliver the equipment at the site of installation. Department will provide all types of documentary support including Customs Duty Clearance. Principals will themselves have to procure any requisite permission from the Govt. of country of origin of equipment.
34. **Agency Commission:** Agency commission, if any, should be clearly mentioned by the Principals in the form of a certificate and will be paid in Indian Currency.
35. **Bank Charges:** Bank charges in India will be borne by the Panjab University and Bank charges abroad will be borne by the suppliers.
36. **Similar Models installed:** The Tenderer must mention in the *Techno-Commercial bid* the similar model of equipment installed in India *during the last two years* and the *addresses of contact persons at these places*.
37. **Application Specialist:** The Tenderer should mention in the *Techno-Commercial bid* the availability and *names* of *Application Specialist* and *Service Engineers* in the nearest regional office.
38. **Response Time:** The Tenderer should mention in the *Techno-Commercial bid* the response time for attending to a complaint about the equipment.
39. **Change of Indian Representatives:** The original manufacturer/Principals should give an undertaking that the aforementioned warranty and availability of spares clauses will be valid even in the case of change of their representatives in India.

## Specifications for Small Angle X-ray Scattering System

Type of analysis: Equipment for analysis of isotropic and anisotropic materials by small and wide angle x-ray scattering (SAXS and WAXS). The Instrument should be capable of measuring Soft matter like Surfactants, Proteins, Polymers, Complex Fluids and other weakly scattering matter with 30 mins using a High Intense and High Resolution system design. The system should be from reputed make having own manufacturing and should have well documented catalog with catalog number. The setup must work on 220V, 50 Hz single phase supply.

### Technical Specifications:

1. **X-ray Source / Flux density:** Any Suitable Cu K-alpha X-Ray Source (e.g. Rotating anode or sealed x-ray tube) to provide the monochromatic flux density at sample should be  $1 \times 10^5$  photon/sec at 1mm sq. area. The X-ray source should offer the ability to use point focus/point and line focus depending upon the design of system.  
Technical specifications for X-Ray Source and Generator - better than 1 kW with stability  $< 0.005\%$  for high voltage and current with 10% variation of main supply.
2. **X-ray optics:** Any suitable Optics (e.g. Focused optics or graded multilayer optics) for collimating the X-ray beam to get a highly intense flux at the sample.
3. **Detector and resolution:** A suitable 2D semiconductor direct photon counting detector with active detection area (non tapered) of minimum  $2500 \text{ mm}^2$  or larger to be offered. The detector should be capable to perform SAXS/WAXS measurement in the desired region covering a q-range from  $0.04 \text{ nm}^{-1}$  to  $38 \text{ nm}^{-1}$  with a delta-q of  $0.007 \text{ nm}^{-1}$ . The pixel size of the detector must be  $100 \times 100 \text{ }\mu\text{m}$  or smaller. Local Dynamic Range of detector should be in the order of  $10^6$  cps/pixel or better. The detector shall not have any defective pixel-strips, areas or similar and it should guarantee in writing in bid. The performance with respect to the number of defective pixels must be specified and must be  $< 0.1\%$  and there should be no need for calibration
4. **Sample stage movement and Beam Path assembly:** For easily measuring SAXS and WAXS data, an automated movement of the sample stage is required. automated movement along the beam axis from SAXS position (large sample-to-detector distance) to WAXS position (short sample-to-detector distance) is required. Source to detector optics should have fixed distance. Translation precision better than  $5 \text{ }\mu\text{m}$ . The complete

entire SAXS and WAXS beam path should be under vacuum and a noise free pump should maintain the vacuum better than 3 mbar throughout the experiment.

5. **System Resolution:** The SAXS system should resolve and measure particle sizes from 1nm up to 80 nm diameter or better and should be capable to measure d-spacing up to 160 nm.
6. **Beam size:** Any Suitable Well defined Beam Size to fulfill the requirement of High Flux and High Resolution.
7. **Beam Stop:** A motorized beam stop movable with an integrated PIN-diode detector or similar suitable detector for intensity measurements and sample absorption data correction. A single click option for beam intensity monitoring should be possible or similar feature should be available.
8. **System Alignment:** All the system components should be motorized for control from computer, to ensure automatic alignment of the complete system.
9. **Sample stage:** A motorized sample stage for easy sample loading and sample temperature control (-10°C to 100°C or better) to be included with system.
10. **Sample holders:** Suitable multiple sample holders for solid and powder samples, sample holder for liquid, dispersion, emulsion, suspension, macromolecule solution samples should be quoted.
11. **Measurement Times:** Time resolved experiments on suitable samples to be performed from seconds onwards. Typical measurement times should be 1 min.
12. **Radiation Safety:** The system should be designed to meet safety radiation of 1  $\mu$  SV/hr or less under regular operation. System should also equipped with safety sensors, which activates automatically under unsafe system operation and close X-ray shutters.
13. **Data Analysis Software:** System Software should be Powerful image processing and data evaluation software, which effectively speeds up the processing of SAXS and WAXS raw data. The software should be capable to perform basic operations such as profile averaging, background/buffer subtraction, radius of gyration calculations, determination of particle shape and structure, calculation and generation of pair-distance distribution plots, etc. The software should allow to interpret scattering data of interacting (i.e., concentrated or charged) particle systems from a single experiment eliminating the need to run a series of measurements with different concentrations. In order to relate structure models to the obtained results, the software should calculate theoretical models.



It should allow to design individual structure models or to import crystallographic structure files (e.g. Protein Data Bank files or other file formats). Software for analyzing biological samples to be quoted. At least ten licenses of data analysis software to be provided. WAXS data base to be included.

Software should be updated when available without additional cost. Company should provide written undertaking for free support for data acquisition software for at least 10 years from the time of installation.

14. **System Control:** The system should be PC controlled and software capable of automated instrument control should be offered.
15. **Computers & Printer:** Two PC (one for data acquisition and one for data analysis) to be quoted.  
Specifications: Computer should be compatible with the system and capable of handling the quoted software and hardware. Work station should be latest branded desktop, I7 or higher processor, DVD-RW drive, HDD 1TB or better, 16 GB DDR RAM, 21 inch LED Monitor, Windows operating system along with one colored laser printer and one b/w laser printer, Separate similar computer (to be networked with primary computer) for data analysis.
16. Suitable Air Compressor, Circulator, Air Dryer and Imported chiller/ heat exchanger of adequate capacity for the instrument to be quoted (if required for full functioning of instrument).
17. The firm should have at least 2 installations of SAXS instrument within India for desired experience of maintenance.
18. A suitable ISO-9001 certified Indian-make 10KVA online UPS with a minimum backup of 2 hours. Service should be available locally.
19. The system must be fully CE compliant.
20. The complete system should offer with the confirmation of availability of spares for 10 years and quoted model should be latest model and an original certificate from manufacturer should be attached with the bid.
21. Warranty as per clause 6 of Section II of terms and conditions of this documents must be included
22. A complete set of installation CDs/DVDs to be provided. Also set of manuals including service and operational manuals and required hardware and software documents should be provided in the form of hard copy as well as soft copy.

23. **Optional attachments and accessories for instrument:**

Following items may be quoted optionally

- a. Price for any additional hardware attachments such as auto sampler, multiple capillary holder, multiple solid sample holder for high throughput screening of samples should be offered.
  - b. Sample stage to perform GI-SAXS measurements with XYZ translation movement precision accuracy of +/- 0.1 um and angular positioning accuracy of +/- 0.005° should be offered.
  - c. Sample stages in various temperature ranges may be quoted
  - d. Sample holders for highly viscous paste / gel samples to be offered. A flow through sample holder for reaction monitoring and a rotating capillary sample holder for powder, micro volume cell with sample recovery capabilities should be quoted.
  - e. A setup for sample parameter identification such as viscosity, shear stress etc. consisting of Rheology measurement system for the Rheological analysis of wide range samples having following basic specifications may be quoted.
    - i. Motor technology: Synchronous EC motor/Brushless DC motor/ dynamic motor with air bearing.
    - ii. Torque range from 5nNM to 200nNM or better
    - iii. Normal force range: 0.01 to 50N
    - iv. Automatic gap control
    - v. Temperature range: 0 to 200°C
    - vi. measuring plate with diameter of 25mm and 50mm and measuring cone with diameter 40mm and angle 1deg.
    - vii. All required utilities should be offered.
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