

INVITATION TO TENDER

No. CeNS/2015-16/Tender/013

17th March 2016

The Centre invites Tender bid(s) for the following items detailed below.

SL No	ENQUIRY NO & DATE	Description of Items	Catalogue No/ Product Code	Qty
1)	CeNS/2015-16/SA/F06 & 15/03/2016	Reaction Ion Etching (RIE) System Note: Detailed Specification in Annexure 1.		1 No
2)	CeNS/2015-16/SA/F07 & 15/03/2016	Thermal Evaporation System Note: Detailed Specification in Annexure 2.		1 No
3)	CeNS/2015-16/SA/F09 & 15/03/2016	Integrated IV/CV characterization System Note: Detailed Specification in Annexure 3.		1 No
4)	CeNS/2015-16/SA/F10 & 17/03/2016	Probe Station. Note: Detailed Specification in Annexure 4.		1 No
Note: Tender bid(s) should be submitted separately for each item along with separate EMD. Combined bids are liable for rejection.				

NOTE:

- (a) The Tender sealed bid (s) containing **two separate sealed envelopes**, clearly marked as “Techno-Commercial Bid and “Price Bid along with Compliance Statement should be submitted on or before 24 March 2016 by 5.00PM through Speed Post / Courier / Registered Post.
- (b) The Tender bid may be addressed to the Director, Centre for Nano and Soft Matter Sciences PB No: 1329, Prof. U.R Rao Road, Jalahalli, Bangalore-560013. The bid should be accompanied with and Earnest Money Deposit of Rs.50,000/- in the form of a Demand Draft of Nationalized bank drawn in favor of “The Director, Centre for Nano and Soft Matter Sciences”, payable at Bengaluru. The EMD will be refunded to unsuccessful bidders without any interest thereon.
- (c) The cost of Packing, Freight & Insurance (CIF Bangalore) should be indicated separately. A brochure giving technical details of the product should be enclosed.
- (d) Discount if any should be clearly mentioned.
- (e) Delivery schedule, warranty details must be clearly indicated.
- (f) Taxes & duties should be separately shown.
- (g) Tender bid(s) should be valid for a minimum period of **3 months** from the date of issue.

(h) **Terms of payment:**

i) For Imported Equipment: 90% through Letter of Credit with usance period of 30 days on proof of arrival of consignment. The balance 10% payment will be released after expiry of the applicable Warranty period or on submission of Performance Bank Guarantee for an equivalent amount (10% of the Invoice value), having validity up to three months from the date of expiry of the applicable Warranty period.

ii) For Indigenous Equipment: the payment in INR shall be made through NEFT/RTGS after successful installation and against submission of performance Bank Guarantee equal to 10% value of the equipment, valid for the period of warranty. Complete details such as the bank account number/IFSC/SWIFT/Bank Address, etc. should be provided along with the price bid.

(i) **Opening of bids:** The firm shall be at liberty to authorize a representative to be present at the opening of the tender at the time and date which will be informed by E-mail. A proper letter of authority be produced before the meeting.

(j) Any firm representing the actual supplier should submit authorized dealership certificate in original from the principal company.

(k) **Banking charges:** All banking charges applicable outside India will be on suppliers account.

(l) **Guarantee and replacement:** The Supplier shall guarantee that the Items/Equipment supplied shall comply fully with the specifications laid down, for material workmanship and performance. The Guarantee should be as mentioned in the specification.

(m) The Centre reserves the right to accept or reject any quotation or part thereof without assigning any reasons.

(n) Sealed envelopes containing the Separate tender bid(s) should be superscribed with " Tender for CeNS/2015-16/SA/F06 , CeNS/2015-16/SA/F07, CeNS/2015-16/SA/F09 & CeNS/2015-16/SA/F10 ”

(o) Tender bid(s) received after the due date shall not be considered.

(p) The Centre is exempt from paying Central Excise of Customs duty on purchase under the Govt. of India Notification No. 11/280/1993-TU-V dated 11 August 2014.

Yours sincerely

Sd/-
Administrative Officer

ANNEXURE - 1

ENQUIRY NO : CeNS/2015-16/SA/F06

Specifications of Reaction Ion Etching (RIE) System

A Clean room compatible compact Reactive Ion Etching system

- Electro polished high grade Stainless Steel (non magnetic) water cooled chamber of Approx. size 400 mm dia. x 350 mm height with suitable support structure.
- Sufficient number of ports with flanges along with view port on door for loading of substrate
- Approx. 6 inch RF electrode made of aluminum or similar suitable material.
- Gas distribution & shower ring for etch uniformity
- Necessary feed throughs for RF power electrodes and process gas.
- System should be able to handle wafers of 4" dia. or small size multiple wafers in single process cycle.
- Electrode designed for RF power supply of frequency 13.56 MHz and with dark space shield to avoid parasitic plasma.
- Facility for height adjustment and cooling of substrates.
- Preferably imported RF Power Supply, 13.56 MHz frequency, min. 600 Watts with auto matching network, with forward & reflected power monitoring.
- Oil free/Dry Vacuum Pumping system capable of achieving min. 1×10^{-3} mbar.
- Electro pneumatically operated Roughing and Backing Valve.
- Motorized butterfly valve for the accurate control of the process pressure during deposition, in close loop with the capacitance manometer.
- Stainless steel vacuum plumbing lines with necessary bellow adaptors/dampers to arrest vibrations.
- Pirani gauge for measuring vacuum from 1000 mbar to 1×10^{-3} mbar.
- Preferably imported digital capacitance manometer to measure the process pressure.
- Preferably imported metal diaphragm sealed Mass Flow Controller (min. 4 Nos) and ultra high pure gas fittings for
 - Sulfur hexafluoride, SF₆ – 200 sccm
 - Tetrafluoromethane, CF₄ – 200 sccm
 - Oxygen, O₂ – 200 sccm
 - Argon, Ar – 500 sccm
- Gas manifold box to house Mass Flow Controllers (Min. 4 Nos.) with built-in inlet and outlet valve with VCR fittings, inlet and outlet filter and extraction point.
- Suitable Electrical & Control System Control Console.
- Mention etch rate and etch uniformity.
- The supplier should have experience in fabricating RIE system with similar specifications. A list of users of the RIE system of the manufacturer should be provided with contact addresses.
- Photographs of the RIE unit should be included
- Warranty: Comprehensive warranty for 1 year from the date of installation.
The extended warranty for 2 more years for which the Terms should include labour free of cost.
- Power Requirement: 230V Ac, 50 HZ.

ANNEXURE - 2

ENQUIRY NO : CeNS/2015-16/SA/F07

Specifications of Thermal Evaporation System :-

A Clean room compatible compact thermal evaporation system

- Electro polished, Non corrosive Stainless Steel (non magnetic) water cooled chamber of Approx. size 500 mm dia. x 500 mm height with suitable support structure.
- Sufficient number of ports with flanges for connecting high vacuum pumping system, vacuum gauges, gas valves, leak valves, vent valves etc. along with view port on door for loading of substrate
- Chamber base plate provided with necessary feedthroughs/ports for evaporation sources, glow discharge unit and other accessories
- Copper Thermal evaporation source to use with filaments/baskets/boats source – 2 nos.
- Selector switch to select the evaporation sources
- Power supply for Thermal evaporation – 1 no.
- Facility for Ion bombardment cleaning by glow discharge with power supply
- Source shutters, pneumatically operated - 2 nos.
- Quartz crystal thickness monitor - 1 no.
- SS substrate holder with rotation to handle wafers of 4” dia.
- Substrate heater with PID temperature controller for 300 °C.
- Turbo molecular pump of speed 560 l/s for achieving less than 1×10^{-6} mbar in the evaporation chamber.
- Rotary Pumping system capable of achieving min. 1×10^{-3} mbar.
- Electro-pneumatically operated High vacuum, Roughing, Backing leak, and Vent valves.
- Digital Pirani and Penning vacuum measuring gauges for measuring vacuum from 1000 mbar to 1×10^{-6} mbar.
- Stainless steel vacuum plumbing lines with necessary bellow adaptors/dampers to arrest vibrations.
- Suitable Electrical & Control System Control Console.
- Suitable water chiller and manifold to control gas for pneumatic valves should be supplied with the system
- Photographs of the Thermal Evaporation unit should be included
- System should be upgradable to include Electron Beam Evaporation source of 8 kW with four pockets
- Warranty: Comprehensive warranty for 1 year from the date of installation.
The extended warranty for 2 more years for which the Terms should include labour free of cost.
- Power Requirement: 230V Ac, 50 HZ.

ANNEXURE – 3

ENQUIRY NO : CeNS/2015-16/SA/F09

Technical specification for Integrated IV/CV characterization System

General Description

IV Characterizations System for Characterization of Semiconductor Devices, Thin Films, Nano device structures, Solar Cell Samples, & other material samples real-time plotting, and analysis with high precision and resolution, while remaining a highly integrated, flexible, upgradable and user-friendly package.

Features and functionality

The System must be integrated in that

(1) System mainframe should have

- Multiple slots for insertion of IV, CV modules
- Should have RS232/GPIB, LAN communication ports
- Should have built in PC with display.
- Built-in large capacity hard drive, CD/DVD drive,
- Should have built in GND unit capable upto 4.2 A sink.

The system should have at least two source measure units and one CV units of following specifications.

(2) Source Measure Unit

- Maximum Voltage capability: 100V or better
- Minimum Voltage resolution: 1 μ V.
- Maximum Current capability: 100 mA or better
- Minimum current range expected: 1 pA or better.
- Minimum current resolution: 100 aA or better.

(3) Capacitance voltage i.e. CV unit

- Measuring parameters: Cp-G, Cp-D, Cs-Rs, Cs-D, R-jX, Z-theta.
- Frequency Range: 1 kHz to 5 MHz or better.
- DC voltage level: -25 V to +25 V.
- Programmable DC output modes: Bias, Up Sweep, down Sweep, List Sweep.

(4) System should have Kelvin connection at GND unit.

(5) Provided software should have parameter extraction facility.

(6) All hardware modules must be controlled from within the same overall software application / test executive.

(7) Vendor should confirm Repair & Calibration support facilities in India.

Supplier should provide **technical compliance including explanations without fail** against each point given in the technical specifications for consideration of the offer.

Power requirement: As per Indian electrical standards (230V AC, 50 Hz)

Warranty: Comprehensive warranty for 1 year from the date of installation. The extended warranty for 2 more years for which the Terms should include labour free of cost.

ANNEXURE - 4

ENQUIRY NO : CeNS/2015-16/SA/F10

Specifications for Cleanroom compatible Probe Station for I-V & C-V Measurement

1. **Substrate Size:** 1×1 cm² to 6-inch diameter wafer.
2. **Chuck Details:**
 - (i) **Triaxial Chuck:** ≥ 6" inch diameter
 - (ii) **Chuck Triaxial cable (Force/Sense)**
 - (iii) **3 or more auxiliary chucks with planarity better than ± 3 μm (including Vacuum chuck)**
3. **X,Y, Theta stage:**
 - (i) **Range of movement:** Movement of stage to be at least 15cm × 15 cm in x-y direction
 - (ii) **Theta travel:** 360 degrees
 - (iii) **Resolution in x-y positioning:** < 5 microns or better
 - (iv) **Z travel-** adjustable up to 10mm and load stroke of up to 3mm
 - a) **Platen:** Manual. Course and fine platen lift up to 40mm with precise contact /separation stroke of 200um with a repeatability of <+/- 1μm. compatible with probe card.
 - b) Universal platen: space for up to 16 micro-positioners.
4. **Vacuum Pump:** Suitable vacuum pump compatible to system along with necessary accessories including vacuum tubing
5. **Micropositioners:**
 - (i) Magnetic base micropositioners
 - (ii) Movement of micropositioners should be 12.5 mm in x-y-z directions
 - (iii) Resolution: 2um or better
 - (iv) Four micropositioners with 2m Triaxial cable & accessories
6. **Stereo Microscope:**

Eye-piece: min 30x
Magnification: Total magnification ≥ 320X
Camera: CCD/CMOS high-resolution digital camera with resolution ≥ 3 Mega pixel with compatible software & hardware to view and store the picture of the device in the computer.
Microscope mount: system compatible microscope mount.
Light source: LED / suitable light source and suitable power supply
Head with CMOS port.
7. **Probe Tips:** **25 nos. Tungsten tip with radius 5 microns or better**
8. Measurement capability: **Few pA of current or better.** Voltage of the order of mV. Capacitance of the order of pF or better.
9. **Vibration isolation solution** to be provided to minimize pad damage.
10. Necessary **set of tools** and tweezers for smooth handling of probe station.
11. Training has to be provided to the users and successfully demonstrate the use of probe station for electrical characterization.
12. Standard configurations will be required. **NO CUSTOM BUILT SYSTEMS WILL BE ENTERTAINED.**

13. Parent company should be an established company with good number of installations and after sales support in India as well.
14. Proprietary calibration software for RF with **LRRM and LRM+**.

Options for future upgrade path:

15. RF application for up to 67 GHz with RF positioners, probes, cables, calibration substrates and calibration software
16. Thermal system up to 200 °C
17. Advanced IV and CV measurements setup
18. Shield Enclosure and anti-vibration table

Supplier should provide **technical compliance including explanations without fail** against each point given in the technical specifications for consideration of the offer.

Power requirement: As per Indian electrical standards (230V AC, 50 Hz)

Warranty: Comprehensive warranty for 1 year from the date of installation. The extended warranty for 2 more years for which the Terms should include labour free of cost.