OFFICE OF THE REGISTRAR
MANIPUR TECHNICAL UNIVERSITY, IMPHAL

(A University established under the Manipur Technical University Act, 2016)
Recognised by UGC under Section 2(f) and Section 22 of UGC Act, 1956
www.mtu.ac.in/www.mtuonline.in

NOTICE INVITING TENDER

Imphal, the 9th July, 2019

File No. 1/3/ECE/MTU-2019: Sealed tenders are invited from the intending reputed and registered firms for supply of **"Electron Beam and Thermal Evaporation System"** from SERB sponsored project fund for Electronics & Communication Engineering Department of Manipur Technical University. Detailed specification of the items and terms & conditions of the tender can be collected during office hours from the office of the Registrar Manipur Technical University, Govt. Polytechnic Campus, Takyelpat, Imphal West-795004, Manipur and the same can also be downloaded from the university website i.e. mtu.ac.in.

Bid Reference:	File No. 1/3/ECE/MTU-2019
Date of Commencement of Sale of Bidding Document:	**Date:**10-July-2019**Time:**10:30 hrs.
Last date for Sale of Bidding Document:	**Date:**31-July-2019**Time:**4:30 hrs.
Bid Security Amount (In INR):	**Rs**: 7000 (D.D. should be in favor of Manipur Technical University payable at Imphal)
Tender Fee	**Rs**. 1000
Technical and Financial bid:	**Technical and Financial bid will be done on the same day**
Last date and time for Receipt of Bids:	**Date:3**-August-2019**Time:** 04:00 hrs.
Time and Date of Opening of Bids:	**Date:**5-August-2019 **Time:** 12:30 hrs.
Place of Opening of Bids:	Office of the Registrar, Manipur Technical University
Address for Communication:	Manipur Technical University, Govt. Polytechnic Campus, Takyelpat, Imphal West-795004
Email Address:	manipurtechnicaluniversity@gmail.com
University Website:	mtu.ac.in

Terms and Conditions:

1	**Eligibility Criteria for Bidder**	(A)	➢ **Bidder must have ISO Certification** ➢ Bidder must have supplied minimum 10 nos. of similar equipment's to Government labs / Govt. Institutions / Universities, etc., including any one Indian Institute of Technology. Proof of documents must be enclosed. ➢ Supplier will support the user with all the spares for a minimum period of 10 years. ➢ Bidder must provide **original test report, original warranty certificate and original invoice** with the system from OEM for all imported items. ➢ Bidder shall have to submit audited accounts (Balance sheet profit and loss account) of financial year 2014-15, 2015-16, 2016-2017, and 2017-2018. Audited statement must be signed and stamped by qualified chartered accounted. ➢ Income Tax return for assessment year – 2015-16, 2016-17 and 2017-18 Up to date sales tax clearance certificate. ➢ The bidding agency should be a reputed firm and having all necessary certificates, viz. GST registration certificate, PAN, Registration, Sale Tax clearance Certificate, Authorized Dealership/Distributorship certificate, etc. The photocopies of all the certificates should be attached with the tender. ➢ All detailed specifications with make & model no. of the items accompanied by proper leaflets should be clearly mentioned and attached with the offer.
2	**Utilities**	(A)	➢ Details to be provided in the offer for space, power supply, gases, etc for system operation
3	**Manuals**	(A)	➢ Operation Manual to be given after installation and acceptance of equipment
4	**User Training**	(A)	➢ Training for 1-2 users from **Manipur Technical University, Manipur** should be provided to make them well familiar with the operation of various components and successful growth of the thin films using the given deposition units.
5	**Associated Accessories**	(A)	➢ Tungsten Basket – 200A - 5 No's ➢ Molybdenum Boat – 200A -5 No's ➢ Quartz Crystal - 10 No's ➢ Molybdenum crucibles -6 No's ➢ Graphite Crucibles -12 No's ➢ EB3 gun insulator - 1 Set ➢ EB3 gun filament (Pack of 5 No's) - 1 Pack's
6	**SAFETY AND INTERLOCKS**	(A)	➢ Necessary safety devices and interlocks are provided for the entire unit for operator's safety.
7	**Delivery Schedule**	(A)	➢ Delivery, **installation, training** of the equipment should be made within 90 (Ninety) days from the date of issue of Purchase Order or as per the terms and condition of the **Purchase Order**.
8	**Payment**		➢ The rate quoted must be both in words and figures inclusive of all charges i.e. packing, forwarding, octroi, surcharge, insurance, installation, demonstration and other charges if any. ➢ Payment 90% shall be made only after receipt of ordered items as per specification and quantity and the remaining 10% payment shall be made after successful installation, demonstration, training (where applicable) and commissioning.

9	Contact details of the person for all post sale/installation maintenance support should clearly be given with **Name & Designation, Phone No. Fax No, Mobile, E-mail and office address.**
10	All voltages should be compatible with Indian conditions (220-240 V AC with 50 Hz) and similar conditions for three phase supply, if required. Price should include installation charges.
11	Manipur Technical University will not take responsibility and accept any damaged goods during transit.
12	All the legal disputes shall be under the jurisdiction of the Manipur High court, Imphal in the state of Manipur.
13	**Delivery Addres:** Manipur Technical University, Government Polytechnic Campus, Takyelpat, Imphal West-795004

Description: The Electron beam and thermal Evaporation System will be comprised of a one number of Electron beam gun and one number of thermal sources for evaporation. The vacuum system consisting of Diffusion pump and Oil Rotary pump together with system of valves and vacuum measuring hardwares.

Technical Specification:

Sl. No	Items		Specifications
1	**Electron Beam and Thermal Evaporation System Chamber**	(A)	**VACUUM CHAMBER:** ➢ Box type Stainless Steel (SS) chamber size: Approximately 400 mm (W) X 400 mm (D) X 450 to 500 mm (H) [minimum requirement]. ➢ Chamber should have front door openings for easy access of all the chamber gadgetries. ➢ A front opening quick access door is provided for loading & unloading of the substrates. ➢ One high vacuum compatible, toughened glass view port with a suitable assembly to avoid material deposition on the view port is provided on the door. ➢ Chamber must have removable stainless steel shields for easy cleaning. ➢ Necessary ports required for Pumping, Electron beam sources, Thermal electrode, Vent, gauge, DTM Feedthrough, port for GLAD assembly.
		(B)	**ELECTRON BEAM GUN WITH POWER SUPPLY** It should have four-crucible electron beam evaporation source with: ➢ Four 4cc volume crucibles. ➢ 270 beam deflection ➢ Integral x-y beam sweep coils ➢ Water cooling ➢ Quick release electron emitter assembly ➢ Motorized turret mechanism X-Y beam sweep controller with independent control in both X and Y direction of: ➢ Beam position ➢ Beam sweep amplitude ➢ Beam sweep frequency ➢ Sinusoidal, triangular or square oscillation waveforms. **Tetrode based** 3KW electron beam power supply comprising a free-standing power supply module and remote mounting high voltage and gun control panel. Operates at 5kv. ➢ 1 No **Electro-magnetically** operated source shutter for cover the EB evaporation source

		(C)	**THERMAL EVAPORATION SOURCE** ➢ L.T. Evaporation feed through (filament holder)- System should have 1 No's of 200Amps LT Evaporation feed through and Evaporation Source Holder as standard on base plate of the chamber and it can accept Filament/Basket/Boat evaporation sources. ➢ 1 No L.T. Evaporation power Supply: **200 Amps** power supply capable of delivering 200 amps at 10 volts, 100 amps at 20 volts ➢ LT Control: Thyristor controller in the input circuit of LT power supplies with potentiometer to control the evaporation rate. ➢ Separate digital panel meter is provided for LT secondary current. ➢ 1 No Electro-magnetically operated source shutter for cover the Thermal evaporation source
		(D)	**GLAD WORK HOLDER** ➢ GLAD Work holder assembly for glancing angle deposition (GLAD). The sample in its own axis as well as revolve around a vertical axis, passing through the sample center (both axis being perpendicular to each other). ➢ Variable rotation speed of up to 60 rpm. ➢ It should hold substrate size 4" and tilt up to 180 Deg (manually).
		(E)	**ION CLEANING** ➢ H.T. feed through and Power Supply: Power for ion cleaning with **5KV** DC open circuit, **3.5KV at 50 mA** HT Power Supply. ➢ HT Control: Thyristor controller in the input circuit of HT power supplies with potentiometer to control the ion cleaning. ➢ Separate digital panel meter for the HT primary current display
		(F)	**FILM THICKNESS MONITOR** ➢ Digital Thickness Monitor with water cooled Crystal holder, 1 No. of sensor head, feedthrough and Oscillator is provided to measure the rate of deposition and Thickness. ➢ Rate display: 3 digits LED Auto-ranging from 00.00 to **999 Ang. /sec.** ➢ Thickness Display: 4-digit LED Auto ranging from **0.000 to 999.9 k** Ang. ➢ Static thickness resolution: 1Ang at minimum update rate.
2	**Vacuum Pumping System**	(A)	**VACUUM PUMP:** ➢ The vacuum pumping system should consist of Oil diffusion pump pumping system (having the pumping speed of **600 Ltrs/sec**) backed by appropriate oil rotary vacuum pump (displacement capacity of **12 m^3/hr**) capable achieving **5 x 10^{-7} mbar** pressure ➢ Ultimate Pressure: **≤ 5 x 10^{-7} mbar** to be achieved
		(B)	**HIGH VACUUM VALVE:** ➢ **Motorized poppet high vacuum valve** with built in facility to automatically throttle the pumping system by 'cracking' the valve, for maintaining accurate process pressure for ion cleaning processes. ➢ Inbuilt Liquid Nitrogen Trap is incorporated below the High Vacuum Valve.
		(C)	**VACUUM VALVES:** ➢ Electro magnetically operated right angle bellow sealed valves for roughing, backing and high vacuum applications ➢ Vent valve, fine control needle valves to be provided
		(D)	**SS PLUMBING LINE &COLLAR** ➢ SS Plumbing line with flexible hoses & KF connections wherever required with necessary interlocks to be

			provided
		(E)	**VACUUM GAUGES:** ➢ Digital Pirani for monitoring a vacuum range of **1000 mbar to 1 x 10^{-3} mbar.** ➢ Digital penning Gauges for monitoring a vacuum range of **10^{-2} mbar to 10^{-7} mbar**.
3	**Control Console & Instrumentation**	(A)	➢ To house all the displays of Pumps, Gauges, Electron beam controller, LT meter, HT meter etc and Manual **ON/OFF Switch** for pump, valves and power supply. ➢ Should be easy for maintenance.
4	**Mounting Frame / Support Stand**	(A)	➢ Necessary pumping systems can be accommodated below the stand ➢ Must have castor wheels for mobility with arresting pads.
5	**Warranty**	(A)	➢ **12 months** from the date of commissioning and acceptance of equipment
6	**Water Chiller (Closed loop)**		➢ Suitable capacity water chiller to be provided for the whole unit with interlocks, tank, etc.

Sd/-

(Ng. Bhogendra Meitei)
Registrar,
Manipur Technical University
Imphal