

Pondicherry University

Department of Physics

Tender Document

The Department of Physics, Pondicherry University invites sealed tenders under two-bid system for the supply and installation of 1) RF Sputtering system under Department of Science and Technology (DST) project to **Dr. D. Bharathi Mohan, Assistant Professor**. The technical specifications for the equipment's are given below. All tenders should be sent to the address given below. The last date for the submission of tender is **10th March 2015, 3.00 PM**.

Name of the Equipment: Two Targets Magnetron Sputtering System

DETAILED TECHNICAL SPECIFICATIONS

S. No.	Technical Specifications for <u>TWO Targets Magnetron Sputtering System</u>	
	“Two Targets Magnetron sputtering system for the deposition of Metals, Oxides and Sulfides with RF & Pulsed DC with sequential and co-sputtering compatibility”	
	Details	Description
I	Vacuum Assembly	
1	Chamber Details	<ul style="list-style-type: none"> ➤ Cubical/Square shape chamber with front door opening, should accommodate minimum of 2 magnetron sources, substrate heater assembly, thickness monitoring sensor, etc. ➤ RF, DC & Pulsed DC compatible ➤ Helium leak tested for leak rates better than 1×10^{-9} mBar.
2	Chamber material	Stainless steel 304 L or better
3	Vacuum	Ultimate vacuum : 1 E-6 mbar or better
4.	Vacuum Valves	Roughing, Backing, High vacuum, throttle and chamber vent valves compatible for this system with electro pneumatic operation
5.	Pumping*	Rotary pump: $\geq 20 \text{ m}^3/\text{hr}$ from a reputed company with good track record Turbo molecular pump: $\geq 300 \text{ l/s}$ from imported company with good track record on functioning and service. $\geq 700 \text{ l/s}$ with liquid nitrogen trap (should be connected to the rear side of the chamber)
6	Vacuum gauges	Pirani and Penning gauges (digital) or a full range gauge (digital) from a reputed company for measuring both low and high vacuum

		up to 1×10^{-7} mBar.
7	Gas inlet system	2 No. of Mass flow controllers calibrated for Ar and Oxygen gases from any imported companies with a good track record of servicing in nearest places. 2 No. of Needle valves
8	View Ports	2 view ports with toughened glass (2 inch size of each) - HV compatible to view substrate assembly, target assembly and plasma viewing
9	Water cooling	Water cooling channels should be available on the chamber surface and wherever is required.
II	Sputtering Assembly – Upward and Confocal Sputtering configuration	
1.	RF Source	<ul style="list-style-type: none"> ➤ 300 W, 13.56 MHz or greater ➤ An imported RF source from a reputed company with a good track record regarding functioning and servicing. ➤ RF Match box (Automatic) ➤ Incident Power and Reflected Power Indication ➤ Suitable switching arrangement should be provided to switch and connect the RF Magnetron power supply unit to the desired target in the chamber. ➤ Option for 3rd source should be provided in the chamber.
2.	Pulsed DC source	<ul style="list-style-type: none"> ➤ Pulsed DC and normal DC mode should be possible ➤ 2.5 kW or greater (operating power) ➤ Voltage 800 V or better (operating) ➤ Current 3A or better (operating) ➤ Frequency (0 – 50 KHz) or more ➤ Remote indication of Voltage, current, Frequency and duty cycle ➤ Should be Protected against overload, short-circuit and arc
3.	Magnetron Sources	<ul style="list-style-type: none"> ➤ 2 inch size of Magnetron sputtering cathodes (flexible) – imported source from a reputed company, compatible for RF, DC & Pulsed DC modes. ➤ 2 Nos. ➤ Confocal Geometry for sequential and Co-sputtering ➤ RF Shield/filter should be provided if in case both RF and pulsed DC sources used simultaneously. The price for RF Filter should be quoted separately. ➤ Source shutters should be provided for pre ionizing / shielding magnetron. ➤ Cross Contamination Shields to avoid deposition in between cathodes (Isolation Chimney) ➤ Water Flow Switch Interlock for each target.
4.	Special magnetics	Required for uniform sputtering and to give higher target utilization
5.	Sputtering target	System should accommodate 2 targets at a time
6.	Service gas	Integrated Ar gas flow assembly. Argon/Nitrogen/Oxygen will be used for sputtering and thin film preparation. Gas flow should be uniformly distributed inside the chamber.
7.	System capability	To deposit metals, metal oxides and semiconductors.
8.	Shutters for Magnetron sources	Manually operated Shutters needed for two sources individually to avoid cross contamination
III	Substrate holder with Heater and Rotation Assembly	

1	Substrate holder	<ul style="list-style-type: none"> ➤ Circular shape with minimum diameter of 100 mm. ➤ Fixture should be able to accommodate smaller sizes of substrates (10, 20 mm, etc.)
2	Substrate rotation facility	0 – 30 rpm
3	Substrate cleaning facility	Ion bombardment for substrate cleaning facility should be provided
4	Capability to change substrate to target (cathode) distance	Required, distance should be adjustable.
5	Substrate heater with temperature measurement & control through PID & Thyristor controller up to 500 +/- 2 Deg. Cen.	Required & rotation should be possible during heating
6	Substrate Bias assembly	Substrate bias assembly should be provided for depositing high quality of films with less surface roughness and good adhesion on the substrate. This process should be able to done with either RF or DC pulsed power supply.
IV	Power Supply	
1	The whole Sputtering system should operate on 230 V AC, 50 Hz and Single Phase Input Power Supply	Required
2	Additional Power Supply for magnetron, RF mode, Pulsed DC mode, Temperature controller and any other sputtering mode should provide with system.	Required
3	External cooling system for chamber as well as magnetron sources including water Chiller equipped with pumps.	Required
V	Main Frame and Control panel	<ul style="list-style-type: none"> ➤ Chamber Support Frame of epoxy powder coated mild steel material ➤ All interlocks for safety operation ➤ Electrical overload protection ➤ Chamber closed interlock ➤ Compressed Air failure ➤ Emergency stop
VI	Air compressor	A small compressor which is sufficient for this system. Filtered, Less noise and oil free air compressor is required for the operation of all pneumatic valves.
VII	Water Chiller (cooling system)	<ul style="list-style-type: none"> ➤ Flow rate: 30 liters/min ➤ Inlet Temperature: 15 °C ➤ Outlet Temperature: 20 °C
VIII	Computer - Desktop	<ul style="list-style-type: none"> ➤ Desktop PC with monitor and UPS for storing data's and doing analysis.
IX	Spare parts	
1	Set of Essential tools	1 Set of Viton O' rings & Gaskets & 1 extra substrate holder
2	Tools	Major tools for the loading substrates and holder, etc.
X	Manuals	
1	Operational manual, service manual, Trouble shooting manual	Hard copy as well as softcopy & one number each

XI	OPTIONAL ITEMS	
1.	Digital Thickness Monitor (RF compatible)	Required with RS 232 Interface & Sensor SH-102 with cooling facility
2.	Magnetron source	1 inch magnetron source – 1 No. (quote the price individually for imported and indigenous one)
3.	Sputtering targets	2 inch diameter and 3 mm thickness of Ag, Sn and Ti targets each 1 No.
4.	Substrate tilt	Substrate tilt up to 45 degree with rotation and heating is required.
5.	DC pulsed bias power supply	It is required for applying bias to the substrate. Power: 5 kW, Range: 100-1000 V, Maximum current: 5 A; Duty cycle: 10-80%
6.	RF Power supply	<ul style="list-style-type: none"> ➤ 600 W, 13.56 MHz or greater ➤ An imported RF source from a reputed company with a good track record regarding functioning and servicing. ➤ RF Match box (Automatic) ➤ Incident Power and Reflected Power Indication
XII	Pre/Dispatch training, Installation and Commissioning	
1	The supplier should integrate magnetron sputtering with its accessories and demonstrate the operation on the available substrates. The supplier shall issue a test certificate for successful installation and commissioning.	
2	Pre-dispatch training for at least 2 students is required. Training after installation to research scholars at department of physics, Pondicherry University.	
XIII	Norms and Conditions	
1	Detailed design of conceptual drawings of the equipment that you quoted is required.	
2	The quotation should provide breakup with the individual component prices. Give the prices of optional items separately.	
3	All items should have original Test certificates & warranty certificates with clear mention of Item Serial No. Model. No., Year of manufacturing Etc. from original manufacturing company.	
4	The offer should be furnished in comparison form with respect to the tender specification. Specification deviation if any should be highlighted.	
5	Firms having local sales & service support with trained service engineers to offer both emergency & warranty service support within short notice time.	
6	3 years warranty without any additional cost is required for all components and accessories of the system after acceptance test at Pondicherry University otherwise your firm may not be considered.	
7	Supplier should indicate the infrastructure facilities and the provisions such as earthing, space, humidity level and Air conditioning required for the installation and running the system without failure.	

* Give the break up price for pumps. Give the final quote which includes I to X with Turbo pump and with Diffusion pump separately. And, then quote the optional items separately.

TERMS AND CONDITIONS

General Information:

- a) Last date and time of receipt of the Quotations: 10th March 2015, 03.00 PM.
- b) Date and Time of Opening of the Quotations: 10th March 2015, 03.30 PM.
- b) Quotation / Tender Document fee Rs. 500/-
- c) EMD rates: 2.5% of the Total Equipment Cost
- d) Two bid systems have to be strictly followed. One for Technical bid and another for commercial bid and each bid should be submitted in separate sealed covers.
- e) However, the tender document fee and EMD as specified above should be remitted by each firm / bidder, collectively for all their bids advertised under this tender.
- f) Quoting merely the lowest price does not confer any right to any bidder for award of supply order. The University's Purchase Committee, reserves the right to select the equipment any bid under the grounds of specification compliance, technologically advanced quality, proven performance track record, brand reputation, service backup support & training, offer of additional / special features, compatibility with the existing System, etc.
- g) The Tender Document Fee and EMD should be submitted in a separate cover super scribing Bank Demand Draft and which should be enclosed with the technical bid. *Tenders received without the appropriate fees will not be entertained.*
- h). The Photo Copies of the Bank Instruments on payment of EMD should be attached with each bidding covers.
- i) The tender / quotation must be submitted along with the stipulated tender document fee and EMD in the sealed cover, super-scribing the name of the Department / Centre for whose equipments the tender is quoted for.

j) The cover should also contain the information like, Name of the Equipment and Serial Number of Equipments for which the bids are submitted. The name and address of the bidder should also be mentioned at the from address space.

k). The tenders should be addressed to *Dr. D. Bharathi Mohan, Principal Investigator and Assistant Professor, Department of Physics, Pondicherry University, Puducherry – 605 014*. The examples for super-scribing the envelopes of the different categories of tenders are given below:

Tender Submitted under Two bids system for the Department of Physics.

Name of the Equipment: _____

To

Dr. D. Bharathi Mohan
Principal Investigator and Assistant Professor,
Department of Physics,
Pondicherry University,
Puducherry – 605 014.

From

Supplier's Address

In case of local delivery, all tenders are to be dropped in the tender box placed at the Information Facilitation Counter, Bharat Ratna Dr. B. R. Ambedkar Administrative Block, Pondicherry University, R.V. Nagar, Kalapet, Puducherry – 605 014.

I) Quotations will not be accepted through fax / e-mail.

II. Common Conditions (Import or Indigenous)

1. Purchase of Quotation Document:

The Quotation / Tender document can be downloaded from the University website **www.pondiuni.edu.in** or procured from the Pondicherry University on payment of fee as

specified above, by means of a D.D, drawn in favor of **The Finance Officer, Pondicherry University, payable at Puducherry**. The downloaded application should be accompanied with the quotation document fee, in the form of a Demand Draft.

2. Price Schedule

The rates should be quoted for a single unit and also for the total quantity required by the University. The price should include the delivery, installation, training charges, etc. at the respective Department, Pondicherry University. The prices quoted shall remain firm until the equipment is supplied to the respective Department, Pondicherry University.

3. Quoting the Core price & Tax, Duties, Discount etc.

The taxes / duties / discounts, if applicable, are to be explicitly and separately shown in the bid.

4. Eligibility:

The firm must have the requisite domain expertise with regard to supply, installation and post-sale service of the items they are quoting. The firm should have been in existence for at least six years as on the date of this quotation and must have executed at least three orders for this kind of equipment during the last three years.

5. Duty Exemption

The University has been granted the benefit of exemption from the payment of the Central Excise Duty and Customs Duty by the Department of Scientific and Industrial Research (DSIR), India, vide their Notification No.10/97 dt. 01-03-1997 and 51/96 dated 23.07.96 respectively, in respect of

- a) Scientific and technical instruments, apparatus, equipment, Software including computers.
- b) Accessories and spare parts of goods specified in (a) above and consumables.
- c) Computer software, compact disks, CD ROM, Recording magnetic tapes, microfilms, microchips etc.
- d) Prototypes.

Customs duties at Indian port, if any, will be to the account of the University.

6. WARRANTY:

- i) The equipment's covered under the purchase order, when installed, shall be warranted for the quality, workmanship, trouble free operation and performance for a period of at least 36 months from the date of putting the system into operation at the Department of Physics, Pondicherry

University, or at least 42 months from the date of receipt of the last lot of the consignment in India.

ii) If any item covered under warranty fails, the same shall be replaced free of cost including all the applicable charges including shipping cost both ways. The information pertaining to infra-structural, power and any other requirement for satisfactory installation and commissioning of the whole system must be provided by the bidder, at least 120 days in advance of the installation to be commenced if purchase order is issued. All drawing for electrical connections, electrical safety items piping work etc. must be provided in detail.

iii) Complete technical specifications to be included in the Technical bid. Complete technical specifications and literature, including process flow, to be included with the quotation. Manufacturers of various major parts/equipment must be mentioned explicitly.

iv) The necessary service support should be provided by Bidder during the agreement period.

v) The training should be provided by the supplying companies for a minimum period of two days from the date of installation with an expert team.

vi) Technical post sale support by email and telephone will be provided during the period.

vii) Detailed service and operating manuals in English with necessary electronic circuitry shall be provided along with the system.

viii) A clear statement regarding availability of after-sales service and availability of spare-parts for next 5 to 10 years should be included.

ix) A recent customer list (within last five years) with contact details including email address is to be submitted with technical bids / bids as the case may be.

x) If the equipment is proprietary a product, a proprietary product certificate should be enclosed.

xi) The information pertaining to infrastructural, power and any other requirement for satisfactory installation and commissioning of the whole system must be provided by the bidder, at least 30 days in advance of the installation to be commenced if purchase order is issued.

xii) The equipment must operate at 230V / 50 Hz single phase and / or equivalent three phase electrical power.

xiii) If the bidder is an authorized representative in India, they are requested to inform their technical ability to take care of the problems in the system, if developed later within the warranty and outside the warranty period. The responsibility of the Indian agent must be clearly specified.

xiv) The bidder from abroad shall obtain, if required, export permission from the appropriate authorities in his country or the country of origin for items to be shipped to India in case of items to be imported. The University shall provide necessary information if required for this purpose.

xv) The validity of the each quotation should be at least for SIX MONTHS from closing date.

xvi) The offers will not be considered if received after the bid closing date and time.

xvii) The offers received through telex / telefax / e-mail will not be accepted by the University under any circumstances.

xviii) The University shall not be responsible for any delay / loss or non-receipt of quotations by post / courier service.

xix) No unsolicited correspondence shall be entertained after the submission of the offer.

xx) If an order is placed with the firm, the purchase shall be governed by an agreement as per the University rules in force at the time.

xxi) Additional terms and conditions will be incorporated in the purchase order, if needed, to safe guard the interests of the University.

xxii) Quotation is not transferable.

xxiii) In case of any dispute in respect of the quotation, all legal matters shall be instituted within the jurisdiction of the place where the purchaser ordinarily resides.

7. Power to reject the offer:

i) Pondicherry University reserves the right to accept / reject any offer in full or in part or accept any offer other than the lowest offer without assigning any reason thereof. Any offer containing incorrect and incomplete information shall be liable for rejection.

ii) No Agency commission will be paid to any authorized agent in India.

iii) Liquidated damages: Timely supply of the ordered items, installation, commissioning (wherever is applicable) and training etc. is the essence of the contract. In case of failure to supply within the time specified in the Purchase order, a penalty / LD of 0.5% of the total value per week or a part thereof shall be levied subject to a maximum of 7.5% in respect of items which are not supplied. The decision of Pondicherry University shall be final in this regard.

iv) Bidder(s) must be authorized business partners of Global / National service providers of the respective equipment.

v) The Bidders must enclose authorization letter from the respective global / national service providers of the above equipment's particularly mentioning an undertaking that in case of default by the Bidder, they (Global Service Provider) shall take over all the responsibilities of the Bidder.

vi) The Bidder should not be involved in any Bankruptcy filing for protection from it.

vii) The training should be provided by the supplying companies on the specimen and operation of the equipment's for a minimum period of two weeks from the date of installation with an expert team.

viii) For any clarification with respect to technical specifications, please contact the respective Department PI as per the details given below: -

S. No	Name of the PI/Department	Contact Details
1	Dr. D. Bharathi Mohan / Department of Physics	d.bharathimohan@gmail.com 0413 – 2654 786

III. Specific Conditions for Imported Equipment's

1. Payment of EMD:

The Quotation must be accompanied by EMD as stated above, by means of a Demand Draft, drawn in favor of ***The Finance Officer, Pondicherry University, payable at Puducherry.*** *The Small Scale units are exempted from payment of EMD provided they enclose the proof of their exemption Certificate issued by the competent authority.*

2. Payments terms:

i) Normally a letter of Credit will be opened for 90% of CIP price, on receipt of order acknowledgement. However, 100% of the LC also be considered, if the supplier provide Bank Guarantee towards performance Security for the 10 % of the total cost of the equipment to cover the Warranty Period.

ii) Bank charges in India shall be borne by the purchaser and outside India shall be borne by the contractor / supplier.

iii) The offer must be in English. The rates should be indicated both in figures and words against item specified in the given table. It is preferable that the price be quoted in Rupees or in US Dollars or in major foreign currencies.

iv) The total cost should be quoted for FOB as well as CIF – Pondicherry University.

v) However, the price quoted under FOB or should also include the following cost if they are required during the initial stage:

a) Local freight / insurance for Chennai airport to University laboratory.

b) Installation cost if any.

c) Cost of consumables which are required for the equipment for initial operation up to a reasonable time.

vi) In case of the Principal supplier of Foreign country unable to meet the conditions stated at para no.4, the local agent / dealer should fulfill the above said conditions in respect of Local Insurance, Freight, safety transport and installation, etc.

vii) The bidder from within India shall obtain the requisite approval for Imports etc., if required.

REGISTRAR

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