INDIAN INSTITUTE OF TECHNOLOGY DELHI

HAUZ KHAS, NEW DELHI-110016

Dated: 05/02/2015

Open Tender Notice No. IITD/NRF-CES(SP-146)/2015

Indian Institute of Technology Delhi is in the process of purchasing following item(s) as per details as given as under.

Details of the item	Multi-target UHV and HV Sputtering Systems
Earnest Money Deposit to be submitted	**NIL**

Tender Documents may be downloaded from Central Public Procurement Portal http://eprocure.gov.in/eprocure/app.Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website http://eprocure.gov.in/eprocure/app . The portal enrolment is free of cost. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission '.

Tenderers can access tender documents on the website(For searching in the NIC site, kindly go to Tender Search option and type 'IIT'. Thereafter, Click on "GO" button to view all IIT Delhi tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website http://eprocure.gov.in/eprocure/app as per the schedule given in the next page.

No manual bids will be accepted. All quotation (both Technical and Financial should be submitted in the E-procurement portal).

Schedule

Name of Organization	Indian Institute of Technology Delhi
Tender Type (Open/Limited/EOI/Auction/Single)	Open
Tender Category (Services/Goods/works)	Goods
Type/Form of Contract (Work/Supply/ Auction/Service/Buy/Empanelment/ Sell)	Supply
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems)	Others
Is Multi Currency Allowed	YES
Date of Issue/Publishing	05/02/2015 (14:00 Hrs)
Document Download/Sale Start Date	05/02/2015 (14:00 Hrs)
Document Download/Sale End Date	02/03/2015 (17:00 Hrs)
Date for Pre-Bid Conference	N/A
Venue of Pre-Bid Conference	N/A
Last Date and Time for Uploading of Bids	02/03/2015 (17:00 Hrs)
Date and Time of Opening of Technical Bids	03/03/2015 (10:00 Hrs)
Tender Fee	NIL
EMD	NIL
No. of Covers (1/2/3/4)	02
Bid Validity days (180/120/90/60/30)	120 days
Address for Communication	Dr. Vamsi Krishna, Nanoscale Research Facility, Block VI, IIT Delhi, Hauz Khas, New Delhi - 110016
Contact No.	26591255
Fax No.	
Email Address	vamsi@ces.iitd.ac.in

Chairman Purchase Committee
(Buyer Member)

Instructions for Online Bid Submission:

As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal (URL:http://eprocure.gov.in/eprocure/app). The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at:

http://eprocure.gov.in/eprocure/app

REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL:http://eprocure.gov.in/eprocure/app) by clicking on the link "Click here to Enroll". Enrolment on the CPP Portal is free of charge.
2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.), with their profile.
5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
6) Bidder then logs in to the site through the secured log-in by entering their userID / password and the password of the DSC / eToken.

SEARCHING FOR TENDER DOCUMENTS

1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal.
2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the

bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.

3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF formats. Bid documents may be scanned with 100 dpi with black and white option.

4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

SUBMISSION OF BIDS

1) Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.

3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.

4) A standard BoQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

   OR

   In some cases Financial Bids can be submitted in PDF format as well (in lieu of BOQ).

5) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

6) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done.

7) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

8) Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

9) Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.

ASSISTANCE TO BIDDERS

1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 233 7315.

General Instructions to the Bidders

1) The tenders will be received online through portal http://eprocure.gov.in/eprocure/app . In the Technical Bids, the bidders are required to upload all the documents in .pdf format.

2) Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through https://eprocure.gov.in/eprocure/app . Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site https://eprocure.gov.in/eprocure/app under the link "Information about DSC".

3) Tenderer are advised to follow the instructions provided in the 'Instructions to the Tenderer for the e-submission of the bids online through the Central Public Procurement Portal for e Procurement at https://eprocure.gov.in/eprocure/app.

Nanoscale Research Facility

Indian Institute of Technology
HauzKhas, New Delhi-110 016

NOTICE INVITING QUOTATIONS

Dated: 05/02/2015

Subject : **Purchase of Multi-target UHV and HV Sputtering Systems**

Invitation for Tender Offers

Indian Institute of Technology Delhi invites online Bids (Technical bid and Commercial bid) from eligible and experienced OEM (Original Equipment Manufacturer) OR OEM Authorized Dealer for **supply, installation & integration of Multi-target UHV and HV Sputtering Systems** with three years on site comprehensive warranty for the custom designed sub-parts be provided & International user warranty, wherever applicable in case of sub-parts procured from the original equipment manufacturers (OEMs) as desired in the NIQ, should be issued in the name of IIT Delhi from the date of receipt of the material as per terms & conditions specified in the tender document, which is available on CPP Portal http://eprocure.gov.in/eprocure/app

TECHNICAL SPECIFICATIONS:

S. No.		Technical Specifications
System-I: Multi-target UHV Sputtering System		
1.	**Vacuum Chamber (Qty.: 1)**	
	a.	High quality, appropriately surface treated, non-magnetic, non-corrosive stainless steel UHV chamber capable of maintaining ultimate pressure ≤ 1×10^{-9} torr.
	b.	Geometry appropriate in respect of (i) Confocal mounting of **six** (06) magnetron sputter sources (2" dia) each fitted with electro-pneumatic shutters and targets shield to prevent cross-contamination. (ii) Ease of changing sputtering target(s).
	c.	2 numbers of sight ports fitted with toughened glass (windows 100 mm dia) and externally operated shutter to minimize the deposition on them.
	d.	One extra DN CF-F port (flange size 8" dia) with blank off plate for future addition of Cryopump (Preferably side wall mounted).
	e.	Adequate number of CF ports appropriate and compatible to UHV pump flange, pressure gauges, **six** sputtering sources, **Gate valve** (VAT make or equivalent (*to be supplied*) , **air-release valve** (*to be supplied*), 4 gas inlet ports/lines [one from **gas-manifold** with **isolation valves** (*to be supplied*) for mixing 3 gases, and remaining 3 inlet ports/lines directly from respective MFCs each fitted with **isolation valves** (*to be supplied*)], substrate housing table having separate shutter, 8-10 pin low current low voltage **electrical feed through** (*to be supplied*), thickness monitor (*to be supplied*), residual gas analyser RGA (*to be supplied*), etc. Blank offs should be provided for unused ports on the chamber.

	f.	**Plumbing of inert and reactive gases:** Argon (inert gas) can be admitted directly into the chamber and Reactive process gases (nitrogen and oxygen) should be admitted near the substrate holder via a gas ring around the substrate holder.
	g.	Provision of cooling the chamber walls with water be provided.
	h.	Provision of baking upto 150°C complete with suitable heater *(to be supplied)*.
2.	**Substrate holding platform,** custom designed, complete with **Substrate heater, Substrate rotation assembly (Qty.: 1 set)** as per following details	
	a.	Provision of holding substrates of different sizes via rigid clamps (with minimum shadowing) mounted on a circular region which can be heated (hot zone ≥ 60 mm dia). The substrate size may range typically from 5×5 mm^2 to 25×25 mm^2.
	b.	Provision on the sample holder for **mounting a mask** along with substrate after taking out through loadlock.
	c.	**PID controlled substrate heating** and temperature display and control unit: Temperature ≥ 800°C with control and display accuracy ≤ ±1°C, and uniformity ≤ ±5°C over 30 mm dia region.
	d.	**Variable substrate rotation** with maximum speed ≥5 rpm.
	e.	**Separate shutter** on the substrate table.
	f.	Provision of **thickness monitor** close to substrate holding platform.
3.	**a.**	**Load-lock chamber with transfer arm (Qty.: 1)** fitted with vent-valve and suitable ports for mounting rough vacuum and HV pressure sensor, etc. for easy transferring of the substrates.
	b.	*VAT* or equivalent make **Gate valve (Qty.:1)** of flange size appropriate to connect the main deposition chamber and the load lock chamber via the transfer arm
4.	**Vacuum Pumps and Pressure Measuring System (Qty.: 1 set)**	
	a.	*Pfeiffer* or *Leybold* make air-cooled **turbo-molecular pumping unit with controller (Qty: 1 set) for deposition chamber** capable of producing ultimate pressure of **≤ 5×10^{-10} torr**, having a pumping speed **≥600 lps** (for N_2) for continuous pumping during sputtering employing mixture of argon, oxygen and/or nitrogen option.
	b.	*Pfeiffer* or *Leybold* make air-cooled **turbo-molecular pumping unit with controller (Qty: 1 set) for load-lock chamber** capable of producing ultimate pressure of **≤ 1×10^{-6} torr**
	c.	*Pfeiffer* or *Leybold* make **rotary pump (Qty: 2):** **<u>One</u>** of the pumps should be configured to pump both for roughing the chamber (pressure ≤ 5×10^{-3} torr) as well as for TMP-backing purpose complete with connecting flexible SS tubings end fitted with KF couplings, TEE, bellow type isolation valves b/w for isolating rotary pump both from chamber and turbo's backing port. The **<u>other</u>** pump with appropriate technical specifications should be configured so as to be compatible with backing the turbo pump of the load-lock chamber.
	d.	*Pfeiffer* or *Instrutech* or *Leybold* make **Pressure sensors/gauges** for monitoring rough vacuum RV **(Qty.: 3-5)**, HV (**Qty.: 1-2**), and UHV **(Qty.: 1-2)** together with their appropriate display and **controlling unit (Qty.: 1)** complete with cables of length ~ 3m. [The sensors should be respectively mounted appropriately in the system, 2 RV sensors (1 each in the deposition chamber and in the lock chamber) 2 HV sensors (1 each in the deposition chamber and in the lock chamber) 1 UHV sensor should be mounted on the main chamber].
	e.	*VAT* or equivalent make **UHV Gate valve** (Qty.:1) of flange size appropriate to isolate the main deposition chamber from turbo-pump.
5.	**Pulsed DC Supplies (Qty.: 2-5)** *Trumpf-Huttinger* or *Advanced Energy* make (rating ≥ 500 W) **or** having following technical specifications.	
	a.	Air cooled compact DC supply with constant and pulsed DC output.
	b.	DC o/p power ≥ 500 W.

	c.	Operable in constant Power, Constant voltage or Constant current mode.
	d.	Provision of all safety interlocks and fuses and circuit breaker, etc.
	e.	Arc-suppression feature via pulse mode: Pulse frequency range 2-100 kHz or wider; Pulse duration controllable in 1-10 μs with a resolution of 1 μs or better; Arc detection time of 1 μs or less; and Maximum arcing frequency of 50 Hz
	f.	Both local as well as remote (RS232/USB) operation modes are required.
	g.	Both Continuous as well as pulsed modes of operations are required.
	h.	5/25 pin D-type I/O control connector for analog control/monitoring .
	i.	Front panel LCD for electrical parameters, LED status, alarms, etc.
	j.	DC Output cable (length 10 ft/3 m) appropriate to o/p connector on the Magnetron s sources (which is N type).
6.	**RF Generator and Matching Network** of rating **≥300 Watts @13.56 MHz (Qty.: 1 – 2 sets):** *AJA or T&C Power Conversion* or *Seren* make or having following technical specifications:	
	a.	Air cooled compact RF generator.
	b.	RF o/p power ≥300 W.
	c.	RF o/p power regulation ≤ ±3%.
	d.	Output frequency= 13.56 MHz.
	e.	Output Frequency regulation ≤ ±0.005%.
	f.	Output Impedance=50 ohms.
	g.	Provision of safety interlocks in r/o closing of cover/enclosure, vacuum, cooling, pressure, etc.
	h.	Harmonic Distortion ≤ -30 dB.
	i.	Both local as well as remote (RS232/USB) operation modes are required.
	j.	Both Continuous as well as pulsed modes of operations are required.
	k.	15 pin D-type I/O control connector (DC input and output for power control and its monitoring).
	l.	Front panel simultaneous display (LCD) of reflected and transmitted power for and set point power control, alarms, etc.
	m.	'N' type female electrical connector for output power.
	n.	RF Output cable (length 10 ft/3 m) appropriate to o/p connector on generator.
	o.	Compatible Matching-Network unit capable for **wide range of impedance-matching** appropriate to sputtering-plasma applications (extra capacitors be providing to enhance the impedance – matching capability at user end).
	p.	Interconnecting RF-cables connecting the RF-generator and Matching network.
7.	Alternately mounted 2" dia, 200 W rating **UHV compatible Sputter Magnetron Sources (Qty.: 2-6)** : *AJA* make or equivalent having following technical specifications:	
	a.	Compatibility with RF as well as DC Sputtering.
	b.	NdFeB modular magnet array.
	c.	Clamping ring to hold down target.
	d.	"N" type electrical connector.
	e.	Fitted with electro-pneumatic shutter so as to protect the target from cross-contamination.
	f.	Provision of Gas ring with conical chimney for uniform gas distribution.
	g.	Compatibility with both magnetic and non-magnetic targets.
8.	*MKS* or *Bronkhorst* or *Alicat make* NC type elastomer sealed **Mass Flow Controllers (Qty.: 3-4)** and the **display and control unit** for 3 channels or more simultaneously **(Qty.: 1)** complete with associated cables having 145 psig or higher inlet pressure and accuracy 0.1% of FS for following gases/flow ranges: The MFCs should be user configurable with regards to gas calibration, namely for Nitrogen (50 sccm), Oxygen (20 sccm), and Argon (20 sccm).	

9.	**Chamber venting with N_2 and Gas regulators (Qty. 6)**:	
	a.	In addition to venting by ambient air, provision must be made for manually venting the system with nitrogen gas via manual venting valve.
	b.	The vendor has to supply 6 numbers of gas-regulators appropriate to the gas filled bottles (each having capacity equivalent to 7 m^3 water, and ~140 psi gas pressure).
10.	**Residual Gas Analyser** (mass range: 1-200 amu) complete with cables and monitoring software, and CF to KF adaptor with clamps and rings etc. **(Qty.:1 Set):** *Pfeiffer* make or having following technical specifications: Maximum operating pressure $\geq 1\times10^{-5}$ mbar with Channeltron, and $\geq 1\times10^{-4}$ mbar with Faraday cup. Minimum detection limit of $\leq 5\times10^{-14}$ mbar with Channeltron, and $\leq 2\times10^{-11}$ mbar with Faraday cup.	
11.	**Substrate Biasing and power supply (Qty.: 1):** Provision for substrate biasing up to 100 V together with appropriate DC power supply for biasing is to be provided.	
12.	**Film thickness monitor (Qty.: 1):** A standard internationally proven model such as from *Edwards* or *Inficon* make or equivalent be provided together with all spares and connecting cables.	
13.	**3-way switches (Qty.:2):** For connecting the RF/DC-power supplies to any of the 3 magnetron sources – one for RF generator and other for DC power supply.	
14.	**Safety interlocks (Qty.:1 set):** All safety interlocks with sound alarm and/or LED alarm/messages are to be provided for all the equipment components (e.g., vacuum, door, water, compressed air, electrical requirements, etc.) wherever required.	
15.	**Frame, panels and rack (Qty.: 1 set):** A convenient frame, panels and rack be used to mount all the above components to make it a reasonably compact sputter deposition system. The frame should have adjustable height for leveling and castors with stoppers for easy movements and rigid and stable operation of the system be provided.	
16.	**Water Chiller (Qty.:1):** Appropriate rating good quality and make closed-loop water chiller to be provided for taking care of all the needs of the system.	
17.	**Mandatory Accessories**	
	a.	Tool kit containing all the necessary tools (e.g., spanners, screw drivers, aligners, L-end key sets, needle file-sets, cutter, plier, stripper, etc.) necessary for sputtering system should be provided with the system. Tool kits as required for the servicing of the sub-systems like pumps, gauges, power supplies, sputter guns, etc. also to be provided.
	b.	Copper gaskets: At least **5 sets** of spare OFHC copper gaskets wherever mounted are to be provided.
	c.	Viton gaskets for use with FC flanges: At least **5 sets** of spare Viton gaskets wherever mounted are to be provided.
	d.	A hair drier and compressed air gun nozzle (one each) be provided.
	e.	Quartz crystals for Thickness Monitor (5 pcs).
	f.	Suitable gas-plumbing lines and fittings from chamber to gas cylinder.
Optional Items		
1.	**Linear Motion Feedthrough (Qty.: 1)** For 50 mm or higher linear translation movement for moving a shadow-mask parallel and just underneath the substrate surface.	
2.	**CTI-Cryogenics make on-board cryo pump** with suitable controller capable of producing low ultimate pressure $\leq 1\times10^{-9}$ torr in the main chamber, GATE valve (VAT make), rotary pump, backing-pressure sensor and display unit **(Qty.: 1 set)** The cryo-pump should have pumping speed in excess of 4000 lps for water vapors and provision for fast regeneration cycle (time ≤1h).	
3.	**Ion pump** with **suitable supporting pump** combination **(Qty.: 1 set)**	

	appropriate to evacuate the UHV chamber to a base vacuum of 1×10^{-10} torr or lower having pumping speed ≥300 lps (N_2) with a N_2 gas load of 30 sccm, and 6" dia flange size.

System-II: Multi-target HV Reactive Sputtering System		
1.	**Vacuum Chamber (Qty.: 1)**	
	a.	High quality, non-magnetic, non-corrosive stainless steel chamber capable of maintaining ultimate pressure ≤ 1×10^{-7} torr.
	b.	Geometry appropriate in respect of (i) Confocal mounting of **<u>three</u>** (03) magnetron sputter sources (2" dia) each fitted with electro-pneumatic shutters and target-shield to prevent cross-contamination. (ii) easy accessibility via a front door for substrate mounting, etc. (iii) ease of changing targets.
	c.	2 numbers of sight ports fitted with clear toughened glass (100 mm dia) windows and externally operated shutter to minimize the deposition on them.
	d.	**Adequate number of CF ports** appropriate and compatible to HV pump flange, Pressure gauges, **three** sputtering sources, **Gate valve** (VAT make or equivalent (*to be supplied*) , **air-release valve** (*to be supplied*), 4 gas inlet ports/lines [one from **gas-manifold** with **isolation valves** (*to be supplied*) for mixing 3 gases, and remaining 3 gas inlet ports/lines directly from respective MFCs each fitted with **isolation valves** (*to be supplied*)], substrate housing table having separate shutter, 8-10 pin low current low voltage **electrical feed through** (*to be supplied*), thickness monitor *(to be supplied)*, Residual gas analyzer RGA (*to be supplied*), etc. Blank offs should be provided for unused ports on the chamber.
	e.	**Plumbing of inert and reactive gases:** Argon (inert gas) can be admitted directly into the chamber and Reactive process gases (nitrogen and oxygen) should be admitted near the substrate holder via a gas ring around the substrate holder.
	f.	Provision of cooling the chamber walls with water to be provided.
2.	**Substrate holding platform,** custom designed, complete with **Substrate heater, Substrate rotation assembly (Qty.: 1 set)** as per following details.	
	a.	Provision of holding substrates of different sizes via rigid clamps (with minimum shadowing) mounted on a circular region which can be heated (hot zone ≥ 60 mm dia). The substrate size may range typically from 5×5 mm^2 to 25×25 mm^2.
	b.	Provision on the sample holder for **mounting a mask** along with substrate after taking out through laodlock.
	c.	**PID controlled substrate heating** with temperature display and control unit: Temperature ≥ 800°C with control and display accuracy ≤ ±1°C, and uniformity ≤ ±5°C over 30 mm dia region.
	d.	**Variable substrate rotation** with maximum speed ≥ 5 rpm.
	e.	**Separate shutter** on the substrate table.
	f.	Provision for **thickness monitor** close to substrate holding platform.
	g.	Provision of **varying the substrate-target distance** by at least ±25 mm (for use without load lock in specific applications).
	h.	The substrate holding platform should be such that it is easy to load/unload the substrates *from the front-door* as well.
3.	**a.**	**Load-lock chamber with transfer arm (Qty.: 1)** fitted with vent-valve, and suitable ports for mounting rough vacuum and HV pressure sensors, etc. for easy transferring of the substrates.
	b.	*VAT* or equivalent make **Gate valve** (**Qty.:1**) of flange size appropriate to connect the main deposition chamber and the load lock chamber via the transfer arm
4.	**Vacuum Pumps and Pressure Measuring System (Qty.: 1 set)**	

	a.	*Pfeiffer* or *Leybold* make air-cooled **turbo-molecular pumping (TMP) unit with controller (Qty.: 1 set)** capable of producing ultimate pressure of ≤ 1×10^{-7} torr, having a pumping speed ≥ **500** lps (N_2), compatible for continuous pumping during sputtering employing mixture of argon, oxygen and/or nitrogen.
	b.	A suitable *Pfeiffer* or *Leybold* make **Rotary pump (Qty.: 1)** configured to pump both for roughing the chamber (pressure ≤ 5×10^{-3} torr) as well as for TMP-backing purpose complete with connecting flexible SS tubings end fitted with KF couplings, TEE, bellow type isolation valves b/w for isolating rotary pump both from chamber and turbo's backing port.
	c.	*Pfeiffer* or *Instrutech* or *Leybold* make **Pressure sensors/gauges** for monitoring rough vacuum **(Qty.: 2-3)**, and HV (**Qty.: 1-2**) and appropriate display and controlling unit complete with cables of length ~ 3m **(Qty.: 1)** [The two rough vacuum monitoring sensors should be mounted on deposition chamber and load-lock chamber, respectively. The high vacuum sensor should be mounted on the HV deposition chamber].
	d.	*VAT* or equivalent make **Gate valve** (Qty.:1) of flange size appropriate to isolate the main deposition chamber from turbo-pump.
5.	**Pulsed DC Supplies (Qty.: 2-3)** *Trumpf- Huttinger* or *Advanced Energy* make (rating ≥ 500 W) **or** having following technical specifications.	
	a.	Air cooled compact DC supply with constant and pulsed DC output.
	b.	DC o/p power ≥ 1000 W.
	c.	Operable in constant Power, Constant voltage or Constant current mode.
	d.	Provision of all safety interlocks and fuses and circuit breaker, etc.
	e.	Arc-suppression feature via pulse mode: Pulse frequency range 2-100 kHz or wider; Pulse duration controllable in 1-10 μs with a resolution of 1 μs or better; Arc detection time of 1 μs or less; and Maximum arcing frequency of 50 Hz
	f.	Both local as well as remote (RS232/USB) operation modes are required.
	g.	Both Continuous as well as pulsed modes of operations are required.
	h.	15/25 pin D-type I/O control connector for analog control/monitoring.
	i.	Front panel LCD for electrical parameters, LED status, alarms, etc.
	j.	DC Output cable (length 10 ft/3 m) appropriate to o/p connector on the Magnetron s sources (which is N type).
6.	**RF Generator and Matching Network** of rating >300 Watts @13.56 MHz **(Qty.: 1 – 2 sets):** *AJA or T&C Power Conversion* or *Seren* make or having following technical specifications.	
	a.	Air cooled compact RF generator.
	b.	RF o/p power ≥300 W.
	c.	RF o/p power regulation ≤ ±3%.
	d.	Output frequency= 13.56 MHz.
	e.	Output Frequency regulation ≤ ±0.005%.
	f.	Output Impedance=50 ohms.
	g.	Provision of safety interlocks in r/o closing of cover/enclosure, vacuum, cooling, pressure, etc.
	h.	Harmonic Distortion ≤ -30 dB.
	i.	Both local as well as remote (RS232/USB) operation modes are required.
	j.	Both Continuous as well as pulsed modes of operations are required.
	k.	15 pin D-type I/O control connector (DC input and output for power control and its monitoring).

	l.	Front panel simultaneous display (LCD) of reflected and transmitted power for and set point power control, alarms, etc.
	m.	'N' type female electrical connector for output power.
	n.	RF Output cable (length 10 ft/3 m) appropriate to o/p connector on generator.
	o.	Compatible Matching-Network unit capable for **wide range of impedance-matching** appropriate to sputtering-plasma applications (extra capacitors be providing to enhance the impedance –matching capability at user end).
	p.	Interconnecting RF-cables connecting the RF-generator and Matching network.
7.	2" dia, 200 W rating **Sputter Magnetron Sources (Qty.:3):** *AJA* make **<u>OR</u>** having following technical specifications.	
	a.	Compatibility with RF as well as DC Sputtering.
	b.	NdFeB modular magnet array.
	c.	Clamping ring to hold down target.
	d.	"N" type electrical connector.
	e.	Fitted with electro-pneumatic shutter so as to protect the target from cross-contamination.
	f.	Provision of Gas ring with conical chimney for uniform gas distribution.
	g.	Compatibility with both magnetic and non-magnetic targets.
8.	*MKS* or *Bronkhorst* or *Alicat* make NC type elastomer sealed **Mass Flow Controllers MFCs (Qty.: 3-4)** and the **display and control unit** for 3 channels or more simultaneously **(Qty.: 1)** complete with associated cables having 145 psig or higher inlet pressure and accuracy 0.1% of FS for following gases/flow ranges: The MFCs should be user configurable with regards to gas calibration, namely for Nitrogen (50 sccm), Oxygen (20 sccm), and Argon (20 sccm).	
9.	**Chamber venting with N_2 and Gas regulators (Qty. 6)**:	
	a.	In addition to venting by ambient air, provision must be made for manually venting the system with nitrogen gas via manual venting valve.
	b.	The vendor has to supply 6 numbers of gas-regulators appropriate to the gas filled bottles (each having capacity equivalent to 7 m^3 water, and ~140 psi gas pressure).
10.	**Residual Gas Analyser** (mass range: 1-200 amu) complete with cables and monitoring software, and CF to KF adaptor with clamps and rings etc. **(Qty.:1 Set):** *Pfeiffer* make or having following technical specifications: Maximum operating pressure $\geq 1\times10^{-5}$ mbar with Channeltron, and $\geq 1\times10^{-4}$ mbar with Faraday cup, Minimum detection limit of $\leq 5\times10^{-14}$ mbar with Channeltron, and $\leq 2\times10^{-11}$ mbar with Faraday cup.	
11.	**Substrate Biasing and power supply (Qty.: 1):** Provision for substrate biasing up to 100 V together with appropriate DC power supply for biasing is to be provided.	
12.	**Film Thickness monitor (Qty.:1):** A standard internationally proven model such as from *Edwards* or *Inficon* make or equivalent be provided together with all spares and connecting cables.	
13.	**3-way switches (Qty.:2)** for connecting the RF/DC power supplies to any of the 3 magnetron sources – one for RF-generator and other for DC-power supply.	
14.	**Safety interlocks (Qty.:1 set):** All safety interlocks with sound alarm and/or LED alarm/messages are to be provided for all the equipment components (e.g., vacuum, door, water, compressed air, electrical requirements, etc.) wherever required.	
15.	**Frame, panels and rack (Qty.: 1 set):** A convenient frame, panels and rack be used to mount all the above components to make it a reasonably compact sputter deposition system. The frame should have adjustable height for leveling and castors with stoppers for easy movements and rigid and stable operation of the system be provided.	
16.	**Water Chiller (Qty.:1):** Appropriate rating good quality and make closed-loop water chiller to be	

	provided for taking care of all the needs of the system.	
17.	**Mandatory Accessories**	
	a.	Tool kit containing all the necessary tools (e.g., spanners, screw drivers, aligners, L-end key sets, needle file-sets, cutter, pliers, stripper, etc.) necessary for sputtering system should be provided with the system. Tool kits as required for the servicing of the sub-systems like pumps, gauges, power supplies, sputter guns, etc. also to be provided.
	b.	Vacuum grease of good quality (Dow Corning or equivalent make) should be provided along with the system.
	c.	Viton gaskets: At least **10 sets** of spare viton gaskets wherever mounted are to be provided.
	d.	A hair drier and compressed air gun nozzle (one each) be provided.
	e.	Quartz crystals for Thickness Monitor (5 pcs).
	f.	Suitable gas-plumbing lines and fittings from chamber to gas cylinder.

A complete set of tender documents* may be Download by prospective bidder free of cost from the website http://eprocure.gov.in/eprocure/app. Bidder has to make payment of requisite fees (i.e. Tender fees (if any) and EMD) by demand draft in favour of Registrar, IIT Delhi payable at New Delhi.

Terms & Conditions Details

Sl. No.	Specification
1.	**Due date**: The tender has to be submitted before the due date. The offers received after the due date and time will not be considered.
2.	**Preparation of Bids**: The offer/bid should be submitted in two bid systems (i.e.) Technical bid and financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. Financial bid should indicate item wise price for the items mentioned in the technical bid in the given format .pdf format. The Technical bid and the financial bid should be submitted Online.
3.	**About Financial Bid:** The bidding firm, in the event of getting supply-order from IIT Delhi, will have to supply, install and demonstrate the co-sputtering process operation of the sputtering system(s) at IIT Delhi in respect of satisfactory working of each of the sub-parts listed hereunder. **Thus, the bids quoting only for a few sub-part(s) of the two Systems will be out-rightly rejected**.
4.	**Opening of the tender**: The online bid will be opened by a committee duly constituted for this purpose. Online bids (complete in all respect) received will be opened as mentioned at "Annexure: Schedule" in presence of bidders representative if available, Only one representative will be allowed to participate in the tender opening. The technical bid will be opened online first and it will be examined by a technical committee which will decide the suitability as per our specification and requirement. The financial offer/bid will be opened only for the offer/bid which technically meets all our requirements as per the specification, and will be opened in the presence of the vendor's representatives subsequently for further evaluation. The bidders if interested may participate on the tender opening Date and Time. The bidder should produce authorization letter from their company to participate in the tender opening.
5.	**Acceptance/ Rejection of bids:** The Committee reserves the right to reject or drop any of the sub-parts in the two systems or all offers without assigning any reason.
6.	**Pre-qualification criteria:** (i) Bidders should be the manufacturer / authorized dealer. Letter of Authorization from original equipment manufacturer (OEM) on the same and specific to the tender should be enclosed. (ii) An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well. (iii) OEM should be internationally reputed Branded Company. (iv) Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid.
7.	**Performance Security**: The supplier shall require to submit the performance security in the form of irrevocable bank guarantee issued by any Indian Nationalized Bank for an amount which is equal to the **5%** of FOB value within 21 days from the date of receipt of the purchase order/LC and should be kept valid for a period of 60 days beyond the date of completion of warranty period.
8.	**Force Majeure:** The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. • For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes. • If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing

	of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
9.	**Risk Purchase Clause**: In event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from the other source on the total risk of the supplier under risk purchase clause.
10.	**Packing Instructions**: Each package will be marked on three sides with proper paint/indelible ink, the following: i. Item Nomenclature ii. Order/Contract No. iii. Country of Origin of Goods iv. Supplier's Name and Address v. Consignee details vi. Packing list reference number
11.	**Delivery and Documents:** Delivery of the goods should be made within a maximum of 08 to 16 weeks from the date of placement of purchase order and the opening of LC. Within 24 hours of shipment, the supplier shall notify the purchaser and the insurance company by cable/telex/fax/e mail the full details of the shipment including contract number, railway receipt number/ AAP etc. and date, description of goods, quantity, name of the consignee, invoice etc. The supplier shall mail the following documents to the purchaser with a copy to the insurance company: 1. 4 Copies of the Supplier invoice showing contract number, goods' description, quantity 2. unit price, total amount; 3. Insurance Certificate if applicable; 4. Manufacturer's/Supplier's warranty certificate; 5. Inspection Certificate issued by the nominated inspection agency, if any 6. Supplier's factory inspection report; and 7. Certificate of Origin (if possible by the beneficiary); 8. Two copies of the packing list identifying the contents of each package. 9. The above documents should be received by the Purchaser before arrival of the Goods (except where the Goods have been delivered directly to the Consignee with all documents) and, if not received, the Supplier will be responsible for any consequent expenses.
12.	**Delayed delivery:** If the delivery is not made within the due date for any reason, the Committee will have the right to impose penalty 1% per week and the maximum deduction is 10% of the contract value / price.
13.	**Prices**: The price should be quoted in net per unit assuming minimum quantities of sub-parts as indicated above in technical specifications and must include all packing and delivery charges. In addition the offer must clearly indicate the **price break-up of sub-parts, failing which the offer will not be considered any further.** The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. However the percentage of taxes & duties shall be clearly indicated. The price should be quoted without custom duty and excise duty, since IIT Delhi is exempted from payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand. **In case of import supply the price should be quoted on FOB Basis only.** Under special circumstances (eg. perishable chemicals), when the item is imported on CIF/CIP, please indicate CIF/CIP charges separately upto IIT Delhi indicating the mode of shipment. IIT Delhi will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges.

14.	**Notices:** For the purpose of all notices, the following shall be the address of the Purchaser and Supplier. **Purchaser:** Dr. Vamsi Krishna, Nancoscale Research Facility, Block VI, Indian Institute of Technology Hauz Khas, New Delhi - 110016. **Supplier:** (To be filled in by the supplier) **(All supplier's should submit its supplies information as per Annexure-II).** _____ _____
15.	**Progress of Supply**: Wherever applicable, supplier shall regularly intimate progress of supply, in writing, to the Purchaser as under: 1. Quantity offered for inspection and date; 2. Quantity accepted/rejected by inspecting agency and date; 3. Quantity dispatched/delivered to consignees and date; 4. Quantity where incidental services have been satisfactorily completed with date; 5. Quantity where rectification/repair/replacement effected/completed on receipt of any communication from consignee/Purchaser with date; 6. Date of completion of entire Contract including incidental services, if any; and **7.** Date of receipt of entire payments under the Contract (In case of stage-wise inspection, details required may also be specified).
16.	**Inspection and Tests:** Inspection and tests prior to shipment of Goods and at final acceptance are as follows: • After the goods are manufactured and assembled, inspection and testing of the goods shall be carried out at the supplier's plant by the supplier, prior to shipment to check whether the goods are in conformity with the technical specifications attached to the purchase order. Manufacturer's test certificate with data sheet shall be issued to this effect and submitted along with the delivery documents. The purchaser shall be present at the supplier's premises during such inspection and testing if need is felt. The location where the inspection is required to be conducted should be clearly indicated. The supplier shall inform the purchaser about the site preparation, if any, needed for installation of the goods at the purchaser's site at the time of submission of order acceptance. • The acceptance test will be conducted by the Purchaser, their consultant or other such person nominated by the Purchaser at its option after the equipment is installed at purchaser's site in the presence of supplier's representatives. The acceptance will involve trouble free operation and ascertaining conformity with the ordered specifications and quality. There shall not be any additional charges for carrying out acceptance test. No malfunction, partial or complete failure of any part of the equipment is expected to occur. The Supplier shall maintain necessary log in respect of the result of the test to establish to the entire satisfaction of the Purchaser, the successful completion of the test specified. • In the event of the ordered item failing to pass the acceptance test, a period not exceeding one weeks will be given to rectify the defects and clear the acceptance test, failing which the Purchaser reserve the right to get the equipment replaced by the Supplier at no extra cost to the Purchaser. • Successful conduct and conclusion of the acceptance test for the installed goods and equipment shall also be the responsibility and at the cost of the Supplier.
17.	**Resolution of Disputes**: The dispute resolution mechanism to be applied pursuant shall be as follows:

	• In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings. The dispute shall be referred to the Director, Indian Institute of Technology (IIT) Delhi and if he is unable or unwilling to act, to the sole arbitration of some other person appointed by him willing to act as such Arbitrator. The award of the arbitrator so appointed shall be final, conclusive and binding on all parties to this order. • In the case of a dispute between the purchaser and a Foreign Supplier, the dispute shall be settled by arbitration in accordance with provision of sub-clause (a) above. But if this is not acceptable to the supplier then the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules. • The venue of the arbitration shall be the place from where the order is issued.
18.	**Applicable Law:** The place of jurisdiction would be New Delhi (Delhi) INDIA.
19.	**Right to Use Defective Goods** If after delivery, acceptance and installation and within the guarantee and warranty period, the operation or use of the goods proves to be unsatisfactory, the Purchaser shall have the right to continue to operate or use such goods until rectifications of defects, errors or omissions by repair or by partial or complete replacement is made without interfering with the Purchaser's operation.
20.	**Supplier Integrity** The Supplier is responsible for and obliged to conduct all contracted activities in accordance with the Contract using state of the art methods and economic principles and exercising all means available to achieve the performance specified in the contract.
21.	**Training** The Supplier is required to provide training to the designated Purchaser's technical and end user personnel in respect of complete operation of the UHV and HV sputtering systems to enable them to effectively operate the total equipment.
22.	**Installation & Demonstration** The supplier is required to done the installation and demonstration of the equipment within one month of the arrival of materials at the IITD site of installation. The installation will be deemed complete subject to (i) achieving the ultimate pressure of $\leq 1\times10^{-9}$ Torr (in case of UHV system) and $\leq 1\times10^{-7}$ Torr (in case of HV system), and (ii) co-sputtering from the 3 dummy copper targets for over 2 hours while maintaining constant power to the target of value equal to the set RF-power (in case of RF Sputtering) and DC-power (in case of DC Sputtering), constant working pressure and set values of gas flow rates. IIT Delhi will provide the filled gas bottles. Penalty clause will be the same as per the supply of materials for not providing the installation & Demonstration of the equipment.
23.	**Insurance:** For delivery of goods at the purchaser's premises, the insurance shall be obtained by the Supplier in an amount equal to 110% of the value of the goods from "warehouse to warehouse" (final destinations) on "All Risks" basis including War Risks and Strikes. The insurance shall be valid for a period of not less than 3 months after installation and commissioning. **In case of orders placed on FOB/FCA basis, the purchaser shall arrange Insurance. If orders placed on CIF/CIP basis, the insurance should be up to IIT Delhi.**
24.	**Incidental services:** The incidental services also include: • Furnishing of 01 set of detailed operations & maintenance manual. • Arranging the shifting/moving of the item to their location of final installation within IITD premises at the cost of Supplier through their Indian representatives.
25.	**Warranty**: 1. Three years on-site comprehensive warranty for the custom designed sub-parts be provided & International user warranty, wherever applicable in case of sub-parts procured from

	the original equipment manufacturers (OEMs) as desired in the NIQ, should be issued in the name of IIT Delhi from date of installation of Goods at the IITD site of installation. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the contract. If for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall at its discretion make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests. **Note:** <u>If a different period of warranty has been specified in the 'Technical Specifications' then the period mentioned above shall stand modified to that extent</u>**.** 2. The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall immediately within in 02 days arrange to repair or replace the defective goods or parts thereof free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts/goods thereafter. The period for correction of defects in the warranty period is 02 days. If the supplier having been notified fails to remedy the defects within 02 days, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expenses and without prejudice to any other rights, which the purchaser may have against the supplier under the contract.
26.	**Governing Language** The contract shall be written in English language. English language version of the Contract shall govern its interpretation. All correspondence and other documents pertaining to the Contract, which are exchanged by the parties, shall be written in the same language.
27.	**Applicable Law** The Contract shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction.
28.	**Notices** • Any notice given by one party to the other pursuant to this contract/order shall be sent to the other party in writing or by cable, telex, FAX or e mail and confirmed in writing to the other party's address. • A notice shall be effective when delivered or on the notice's effective date, whichever is later.
29.	**Taxes and Duties** Suppliers shall be entirely responsible for all taxes, duties, license fees, octroi, road permits, etc., incurred until delivery of the contracted Goods to the Purchaser. However, VAT in respect of the transaction between the Purchaser and the Supplier shall be payable extra, if so stipulated in the order.
30.	**Agency Commission**: Agency commission if any will be paid to the Indian agent in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in Tender even in case of Nil commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent.
31.	**Payment**: Payment will be made through irrevocable Letter of Credit (LC). Letter of Credit (LC) will be established in the favour of foreign Supplier after the submission of performance security. The letter of credit (LC) will be established on the exchange rates as applicable on the date of establishment. • For Indigenous supplies, 100% payment shall be made by the Purchaser against delivery, inspection, successful installation, commissioning and acceptance of the equipment at IITD in good condition and to the entire satisfaction of the Purchaser and on production of

	unconditional performance bank guarantee as specified in Clause 9 of tender terms and conditions. • For Imports, LC will be opened for 100% FOB/CIF value. 80% of the LC amount shall be released on presentation of complete and clear shipping documents and 20% of the LC amount shall be released after the installation and demonstration of the equipment at the INST site of installation in faultless working condition for period of 60 days from the date of the satisfactory installation and subject to the production of unconditional performance bank guarantee as specified in Clause 9 of tender terms and conditions. • Indian Agency commission (IAC), if any shall be paid after satisfactory installation & commissioning of the goods at the destination at the exchange rate prevailing on the date of negotiation of LC documents, subject to DGS&D registration for restricted items. • All the bank charges within India will be borne by the Institute and outside India will be borne by the Supplier.
32.	**User list:** List of industrial and educational establishments where the items enquired have been supplied must be provided, failing which the quotations will be deemed as incomplete and hence will be rejected.
33.	**Compliance of the offers**: (a) The bidder **MUST** clearly indicate **<u>both</u>** the **point-by-point compliance** of the technical-specifications (as indicated in the technical specifications Table of this document) and also the make/model no. of each of the sub-parts of the two systems should be clearly indicated, failing which the quotations will be deemed as incomplete and hence will be rejected. (b) The compliance of various sub-parts of the systems should be **supported by detailed brochures and also by the web-site links of the quoting firm/original equipment manufacturers,** failing which the quotations will be deemed as incomplete and hence will be rejected.
34.	**Manuals and Drawings** • Before the goods and equipment are taken over by the Purchaser, the Supplier shall supply operation and maintenance manuals. These shall be in such details as will enable the Purchaser to operate, maintain, adjust and repair all parts of the works as stated in the specifications. • The Manuals shall be in the ruling language (English) in such form and numbers as stated in the contract. • Unless and otherwise agreed, the goods equipment shall not be considered to be completed for the purposes of taking over until such manuals and drawing have been supplied to the Purchaser.
35.	**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.
36.	**Site Preparation**: The supplier shall inform to the Institute about the site preparation, if any, needed for the installation of equipment, immediately after the receipt of the purchase order. The supplier must provide complete details regarding space and all the other infrastructural requirements needed for the equipment, which the Institute should arrange before the arrival of the equipment to ensure its timely installation and smooth operation thereafter. The supplier shall visit the Institute and see the site where the equipment is to be installed and may offer his advice and render assistance to the Institute in the preparation of the site and other pre-installation requirements.
37.	**Installation**: The equipment or machinery has to be installed or commissioned by the successful bidder within 30 days from the date of receipt of the item at IITD. 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. IITD will not be liable to any type of losses in any form.
38.	**Spare Parts** The Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier: i. Such spare parts as the Purchaser may elect to purchase from the Supplier, providing that this election shall not relieve the Supplier of any warranty obligations under the Contract; and ii. In the event of termination of production of the spare parts: iii. Advance notification to the Purchaser of the pending termination, in sufficient time to permit the Purchaser to procure needed requirements; and iv. Following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings and specifications of the spare parts, if requested. Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spares for the Goods, such as gaskets, plugs, washers, belts etc. Other spare parts and components shall be supplied as promptly as possible but in any case within six months of placement of order.
39.	**Defective Equipment**: If any of the equipment supplied by the Tenderer is found to be substandard, refurbished, un-merchantable 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 payments for such equipment have already been made. 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. In case supplier fails to replace above item as per above terms & conditions, IIT Delhi may consider "Banning" the supplier.
40.	**Termination for Default** The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the Contract in whole or part: i. If the Supplier fails to deliver any or all of the Goods within the period(s) specified in the order, or within any extension thereof granted by the Purchaser; or ii If the Supplier fails to perform any other obligation(s) under the Contract. iii If the Supplier, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract. • For the purpose of this Clause: i. "**Corrupt practice**" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution. ii. "**Fraudulent practice**" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;'" • In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner, as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Supplier shall continue the performance of the Contract to the extent not terminated.

41.	**Shifting**: After 3-4 years once our new building is ready, the supplier has to shift and reinstall the instrument free of cost.
42.	**Warranty/Guarantee**: The warranty period should be clearly mentioned. The maintenance charges (AMC) under different schemes after the expiry of the warranty should also be mentioned. The tender must be quoted with three (03) years on-site comprehensive warranty/guarantee which will commence from the date of the satisfactory installation/commissioning of the equipment against the defect of any manufacturing, workmanship and poor quality of the components. After the warranty period is over, Annual Maintenance Contract (AMC)/Comprehensive Maintenance Contract (CMC) up to next two years should be started. The AMC/CMC charges will not be included in computing the total cost of the equipment.
43.	**Downtime:** During the warranty period not more than 5% downtime will be permissible. For every day exceeding permissible downtime, penalty of 1/365 of the 5% FOB value will be imposed. Downtime will be counted from the date and time of the filing of complaint with in the business hours.
44.	**Training of Personnel:** The supplier shall be required to undertake to provide the technical training to the personnel involved in the use of the equipment at the Institute premises, immediately after completing the installation of the equipment for a minimum period of one week at the supplier's cost.
45.	**Disputes and Jurisdiction**: Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within New Delhi.
46.	**Compliancy certificate**: This certificate must be provided indicating conformity to the technical specifications.
47.	Wherever needed, IIT Delhi will provide the end-user certificate to the OEMs.
48.	All the electronic instruments quoted as sub-parts in the bid must be supplied compatible with **AC-input line supply of 220V at 50 Hz**.
49.	**Acknowledgement**: It is hereby acknowledged that we have gone through all the conditions mentioned above and we agree to abide by them.

ANNEXURE-I

COMPLIANCE SHEET

S. No.		Technical Specifications	Complied (Yes/No)
System-I:		**Multi-target UHV Sputtering System**	
1.	**Vacuum Chamber (Qty.: 1)**		
	a.	High quality, appropriately surface treated, non-magnetic, non-corrosive stainless steel UHV chamber capable of maintaining ultimate pressure ≤ 1×10^{-9} torr.	
	b.	Geometry appropriate in respect of i. Confocal mounting of **six** (06) magnetron sputter sources (2" dia) each fitted with electro-pneumatic shutters and targets shield to prevent cross-contamination. ii. Ease of changing sputtering target(s).	
	c.	2 numbers of sight ports fitted with toughened glass (windows 100 mm dia) and externally operated shutter to minimize the deposition on them.	
	d.	One extra DN CF-F port (flange size 8" dia) with blank off plate for future addition of Cryopump (Preferably side wall mounted).	
	e.	Adequate number of CF ports appropriate and compatible to UHV pump flange, pressure gauges, **six** sputtering sources, **Gate valve** (VAT make or equivalent (*to be supplied*) , **air-release valve** (*to be supplied*), 4 gas inlet ports/lines [one from **gas-manifold** with **isolation valves** (*to be supplied*) for mixing 3 gases, and remaining 3 inlet ports/lines directly from respective MFCs each fitted with **isolation valves** (*to be supplied*)], substrate housing table having separate shutter, 8-10 pin low current low voltage **electrical feed through** (*to be supplied*), thickness monitor (*to be supplied*), residual gas analyser RGA (*to be supplied*), etc. Blank offs should be provided for unused ports on the chamber.	
	f.	**Plumbing of inert and reactive gases:** Argon (inert gas) can be admitted directly into the chamber and Reactive process gases (nitrogen and oxygen) should be admitted near the substrate holder via a gas ring around the substrate holder.	
	g.	Provision of cooling the chamber walls with water be provided.	
	h.	Provision of baking upto 150°C complete with suitable heater *(to be supplied)*.	
2.	**Substrate holding platform,** custom designed, complete with **Substrate heater, Substrate rotation assembly (Qty.: 1 set)** as per following details		
	a.	Provision of holding substrates of different sizes via rigid clamps (with minimum shadowing) mounted on a circular region which can be heated (hot zone ≥ 60 mm dia). The substrate size may range typically from 5×5 mm^2 to 25×25 mm^2.	
	b.	Provision on the sample holder for **mounting a mask** along with substrate after taking out through laodlock.	
	c.	**PID controlled substrate heating** and temperature display and control unit: Temperature ≥ 800°C with control and display accuracy ≤ ±1°C, and uniformity ≤ ±5°C over 30 mm dia region.	
	d.	**Variable substrate rotation** with maximum speed ≥5 rpm.	
	e.	**Separate shutter** on the substrate table.	
	f.	Provision of **thickness monitor** close to substrate holding platform.	
3.	**a.**	**Load-lock chamber with transfer arm (Qty.: 1)** fitted with vent-valve and suitable ports for mounting rough vacuum and HV pressure sensor, etc. for easy transferring of the substrates.	

	b.	*VAT* or equivalent make **Gate valve (Qty.:1)** of flange size appropriate to connect the main deposition chamber and the load lock chamber via the transfer arm	
4.	**Vacuum Pumps and Pressure Measuring System (Qty.: 1 set)**		
	a.	*Pfeiffer* or *Leybold* make air-cooled **turbo-molecular pumping unit with controller (Qty: 1 set) for deposition chamber** capable of producing ultimate pressure of **≤ 5×10^{-10} torr**, having a pumping speed **≥600 lps** (for N_2) for continuous pumping during sputtering employing mixture of argon, oxygen and/or nitrogen option.	
	b.	*Pfeiffer* or *Leybold* make air-cooled **turbo-molecular pumping unit with controller (Qty: 1 set) for load-lock chamber** capable of producing ultimate pressure of **≤ 1×10^{-6} torr**	
	c.	*Pfeiffer* or *Leybold* make **rotary pump (Qty: 2):** **<u>One</u>** of the pumps should be configured to pump both for roughing the chamber (pressure ≤ 5×10^{-3} torr) as well as for TMP-backing purpose complete with connecting flexible SS tubings end fitted with KF couplings, TEE, bellow type isolation valves b/w for isolating rotary pump both from chamber and turbo's backing port. The **<u>other</u>** pump with appropriate technical specifications should be configured so as to be compatible with backing the turbo pump of the load-lock chamber.	
	d.	*Pfeiffer* or *Instrutech* or *Leybold* make **Pressure sensors/gauges** for monitoring rough vacuum RV **(Qty.: 3-5)**, HV (**Qty.: 1-2**), and UHV **(Qty.: 1-2)** together with their appropriate display and **controlling unit (Qty.: 1)** complete with cables of length ~ 3m. [The sensors should be respectively mounted appropriately in the system, 2 RV sensors (1 each in the deposition chamber and in the lock chamber) 2 HV sensors (1 each in the deposition chamber and in the lock chamber) 1 UHV sensor should be mounted on the main chamber].	
	e.	*VAT* or equivalent make **UHV Gate valve** (Qty.:1) of flange size appropriate to isolate the main deposition chamber from turbo-pump.	
5.	**Pulsed DC Supplies (Qty.: 2-5)** *Trumpf-Huttinger* or *Advanced Energy* make (rating ≥ 500 W) **or** having following technical specifications.		
	a.	Air cooled compact DC supply with constant and pulsed DC output.	
	b.	DC o/p power ≥ 500 W.	
	c.	Operable in constant Power, Constant voltage or Constant current mode.	
	d.	Provision of all safety interlocks and fuses and circuit breaker, etc.	
	e.	Arc-suppression feature via pulse mode: Pulse frequency range 2-100 kHz or wider; Pulse duration controllable in 1-10 μs with a resolution of 1 μs or better; Arc detection time of 1 μs or less; and Maximum arcing frequency of 50 Hz	
	f.	Both local as well as remote (RS232/USB) operation modes are required.	
	g.	Both Continuous as well as pulsed modes of operations are required.	
	h.	5/25 pin D-type I/O control connector for analog control/monitoring .	
	i.	Front panel LCD for electrical parameters, LED status, alarms, etc.	
	j.	DC Output cable (length 10 ft/3 m) appropriate to o/p connector on the Magnetron s sources (which is N type).	
6.	**RF Generator and Matching Network** of rating **≥300 Watts @13.56 MHz (Qty.: 1 – 2 sets):** *AJA or T&C Power Conversion* or *Seren* make or having following technical specifications.		

	a.	Air cooled compact RF generator.	
	b.	RF o/p power ≥300 W.	
	c.	RF o/p power regulation ≤ ±3%.	
	d.	Output frequency= 13.56 MHz.	
	e.	Output Frequency regulation ≤ ±0.005%.	
	f.	Output Impedance=50 ohms.	
	g.	Provision of safety interlocks in r/o closing of cover/enclosure, vacuum, cooling, pressure, etc.	
	h.	Harmonic Distortion ≤ -30 dB.	
	i.	Both local as well as remote (RS232/USB) operation modes are required.	
	j.	Both Continuous as well as pulsed modes of operations are required.	
	k.	15 pin D-type I/O control connector (DC input and output for power control and its monitoring).	
	l.	Front panel simultaneous display (LCD) of reflected and transmitted power for and set point power control, alarms, etc.	
	m.	'N' type female electrical connector for output power.	
	n.	RF Output cable (length 10 ft/3 m) appropriate to o/p connector on generator.	
	o.	Compatible Matching-Network unit capable for **wide range of impedance-matching** appropriate to sputtering-plasma applications (extra capacitors be providing to enhance the impedance –matching capability at user end).	
	p.	Interconnecting RF-cables connecting the RF-generator and Matching network.	
7.	Alternately mounted 2" dia, 200 W rating **UHV compatible Sputter Magnetron Sources (Qty.: 2-6)** : *AJA* make or equivalent having following technical specifications:		
	a.	Compatibility with RF as well as DC Sputtering.	
	b.	NdFeB modular magnet array.	
	c.	Clamping ring to hold down target.	
	d.	"N" type electrical connector.	
	e.	Fitted with electro-pneumatic shutter so as to protect the target from cross-contamination.	
	f.	Provision of Gas ring with conical chimney for uniform gas distribution.	
	g.	Compatibility with both magnetic and non-magnetic targets.	
8.	*MKS* or *Bronkhorst* or *Alicat make* NC type elastomer sealed **Mass Flow Controllers (Qty.: 3-4)** and the **display and control unit** for 3 channels or more simultaneously **(Qty.: 1)** complete with associated cables having 145 psig or higher inlet pressure and accuracy 0.1% of FS for following gases/flow ranges: The MFCs should be user configurable with regards to gas calibration, namely for Nitrogen (50 sccm), Oxygen (20 sccm), and Argon (20 sccm).		
9.	**Chamber venting with N_2 and Gas regulators (Qty. 6)**:		
	a.	In addition to venting by ambient air, provision must be made for manually venting the system with nitrogen gas via manual venting valve.	
	b.	The vendor has to supply 6 numbers of gas-regulators appropriate to the gas filled bottles (each having capacity equivalent to 7 m^3 water, and ~140 psi gas pressure).	
10.	**Residual Gas Analyser** (mass range: 1-200 amu) complete with cables and monitoring software, and CF to KF adaptor with clamps and rings etc. **(Qty.:1 Set):** *Pfeiffer* make or having following technical specifications: Maximum operating pressure ≥1×10^{-5} mbar with Channeltron, and ≥1×10^{-4} mbar with Faraday cup. Minimum detection limit of ≤ 5×10^{-14} mbar with Channeltron, and ≤ 2×10^{-11} mbar with Faraday cup.		

11.	**Substrate Biasing and power supply (Qty.: 1):** Provision for substrate biasing up to 100 V together with appropriate DC power supply for biasing is to be provided.		
12.	**Film thickness monitor (Qty.: 1):** A standard internationally proven model such as from *Edwards* or *Inficon* make or equivalent be provided together with all spares and connecting cables.		
13.	**3-way switches (Qty.:2):** For connecting the RF/DC-power supplies to any of the 3 magnetron sources – one for RF generator and other for DC power supply.		
14.	**Safety interlocks (Qty.:1 set):** All safety interlocks with sound alarm and/or LED alarm/messages are to be provided for all the equipment components (e.g., vacuum, door, water, compressed air, electrical requirements, etc.) wherever required.		
15.	**Frame, panels and rack (Qty.: 1 set):** A convenient frame, panels and rack be used to mount all the above components to make it a reasonably compact sputter deposition system. The frame should have adjustable height for leveling and castors with stoppers for easy movements and rigid and stable operation of the system be provided.		
16.	**Water Chiller (Qty.:1):** Appropriate rating good quality and make closed-loop water chiller to be provided for taking care of all the needs of the system.		
17.	**Mandatory Accessories**		
	a.	Tool kit containing all the necessary tools (e.g., spanners, screw drivers, aligners, L-end key sets, needle file-sets, cutter, plier, stripper, etc.) necessary for sputtering system should be provided with the system. Tool kits as required for the servicing of the sub-systems like pumps, gauges, power supplies, sputter guns, etc. also to be provided.	
	b.	Copper gaskets: At least **5 sets** of spare OFHC copper gaskets wherever mounted are to be provided.	
	c.	Viton gaskets for use with FC flanges: At least **5 sets** of spare Viton gaskets wherever mounted are to be provided.	
	d.	A hair drier and compressed air gun nozzle (one each) be provided.	
	e.	Quartz crystals for Thickness Monitor (5 pcs).	
	f.	Suitable gas-plumbing lines and fittings from chamber to gas cylinder.	
Optional Items			
1.	**Linear Motion Feedthrough (Qty.: 1)** For 50 mm or higher linear translation movement for moving a shadow-mask parallel and just underneath the substrate surface.		
2.	**CTI-Cryogenics make on-board cryo pump** with suitable controller capable of producing low ultimate pressure ≤ 1×10^{-9} torr in the main chamber, GATE valve (VAT make), rotary pump, backing-pressure sensor and display unit **(Qty.: 1 set)** The cryo-pump should have pumping speed in excess of 4000 lps for water vapors and provision for fast regeneration cycle (time ≤1h).		
3.	**Ion pump** with **suitable supporting pump** combination **(Qty.: 1 set)** appropriate to evacuate the UHV chamber to a base vacuum of 1×10^{-10} torr or lower having pumping speed ≥300 lps (N_2) with a N_2 gas load of 30 sccm, and 6" dia flange size.		

System-II: Multi-target HV Reactive Sputtering System			
1.	**Vacuum Chamber (Qty.: 1)**		
	a.	High quality, non-magnetic, non-corrosive stainless steel chamber capable of maintaining ultimate pressure ≤ 1×10^{-7} torr.	
	b.	Geometry appropriate in respect of (iv) Confocal mounting of **<u>three</u>** (03) magnetron sputter sources (2" dia) each	

		fitted with electro-pneumatic shutters and target-shield to prevent cross-contamination. (v) easy accessibility via a front door for substrate mounting, etc. (vi) ease of changing targets.	
	c.	2 numbers of sight ports fitted with clear toughened glass (100 mm dia) windows and externally operated shutter to minimize the deposition on them.	
	d.	**Adequate number of CF ports** appropriate and compatible to HV pump flange, Pressure gauges, **three** sputtering sources, **Gate valve** (VAT make or equivalent (*to be supplied*) , **air-release valve** (*to be supplied*), 4 gas inlet ports/lines [one from **gas-manifold** with **isolation valves** (*to be supplied*) for mixing 3 gases, and remaining 3 gas inlet ports/lines directly from respective MFCs each fitted with **isolation valves** (*to be supplied*)], substrate housing table having separate shutter, 8-10 pin low current low voltage **electrical feed through** (*to be supplied*), thickness monitor *(to be supplied)*, Residual gas analyzer RGA (*to be supplied*), etc. Blank offs should be provided for unused ports on the chamber.	
	e.	**Plumbing of inert and reactive gases:** Argon (inert gas) can be admitted directly into the chamber and Reactive process gases (nitrogen and oxygen) should be admitted near the substrate holder via a gas ring around the substrate holder.	
	f.	Provision of cooling the chamber walls with water to be provided.	
2.	**Substrate holding platform,** custom designed, complete with **Substrate heater, Substrate rotation assembly (Qty.: 1 set)** as per following details.		
	a.	Provision of holding substrates of different sizes via rigid clamps (with minimum shadowing) mounted on a circular region which can be heated (hot zone ≥ 60 mm dia). The substrate size may range typically from 5×5 mm^2 to 25×25 mm^2.	
	b.	Provision on the sample holder for **mounting a mask** along with substrate after taking out through laodlock.	
	c.	**PID controlled substrate heating** with temperature display and control unit: Temperature ≥ 800°C with control and display accuracy ≤ ±1°C, and uniformity ≤ ±5°C over 30 mm dia region.	
	d.	**Variable substrate rotation** with maximum speed ≥ 5 rpm.	
	e.	**Separate shutter** on the substrate table.	
	f.	Provision for **thickness monitor** close to substrate holding platform.	
	g.	Provision of **varying the substrate-target distance** by at least ±25 mm (for use without load lock in specific applications).	
	h.	The substrate holding platform should be such that it is easy to load/unload the substrates *from the front-door* as well.	
3	**a**	**Load-lock chamber with transfer arm (Qty.: 1)** fitted with vent-valve, and suitable ports for mounting rough vacuum and HV pressure sensors, etc. for easy transferring of the substrates.	
	b	*VAT* or equivalent make **Gate valve** (**Qty.:1**) of flange size appropriate to connect the main deposition chamber and the load lock chamber via the transfer arm	
4.	**Vacuum Pumps and Pressure Measuring System (Qty.: 1 set)**		
	a.	*Pfeiffer* or *Leybold* make air-cooled **turbo-molecular pumping (TMP) unit with controller (Qty.: 1 set)** capable of producing ultimate pressure of ≤ 1×10^{-7} torr, having a pumping speed ≥ **500** lps (N_2), compatible for continuous pumping during sputtering employing mixture of argon, oxygen and/or nitrogen.	
	b.	A suitable *Pfeiffer* or *Leybold* make **Rotary pump (Qty.: 1)** configured to pump both for roughing the chamber (pressure ≤ 5×10^{-3} torr) as well as for TMP-backing purpose complete with connecting flexible SS tubings end fitted with KF couplings, TEE, bellow type isolation valves b/w for isolating rotary pump both	

		from chamber and turbo's backing port.	
	c.	*Pfeiffer* or *Instrutech* or *Leybold* make **Pressure sensors/gauges** for monitoring rough vacuum **(Qty.: 2-3)**, and HV (**Qty.: 1-2**) and appropriate display and controlling unit complete with cables of length ~ 3m **(Qty.: 1)** [The two rough vacuum monitoring sensors should be mounted on deposition chamber and load-lock chamber, respectively. The high vacuum sensor should be mounted on the HV deposition chamber].	
	d.	*VAT* or equivalent make **Gate valve** (Qty.:1) of flange size appropriate to isolate the main deposition chamber from turbo-pump.	
5.	**Pulsed DC Supplies (Qty.: 2-3)** *Trumpf- Huttinger* or *Advanced Energy* make (rating ≥ 500 W) **or** having following technical specifications.		
	a.	Air cooled compact DC supply with constant and pulsed DC output.	
	b.	DC o/p power ≥ 1000 W.	
	c.	Operable in constant Power, Constant voltage or Constant current mode.	
	d.	Provision of all safety interlocks and fuses and circuit breaker, etc.	
	e.	Arc-suppression feature via pulse mode: Pulse frequency range 2-100 kHz or wider; Pulse duration controllable in 1-10 μs with a resolution of 1 μs or better; Arc detection time of 1 μs or less; and Maximum arcing frequency of 50 Hz	
	f.	Both local as well as remote (RS232/USB) operation modes are required.	
	g.	Both Continuous as well as pulsed modes of operations are required.	
	h.	15/25 pin D-type I/O control connector for analog control/monitoring.	
	i.	Front panel LCD for electrical parameters, LED status, alarms, etc.	
	j.	DC Output cable (length 10 ft/3 m) appropriate to o/p connector on the Magnetron s sources (which is N type).	
6.	**RF Generator and Matching Network** of rating >300 Watts @13.56 MHz **(Qty.: 1 – 2 sets):** *AJA or T&C Power Conversion* or *Seren* make or having following technical specifications.		
	a.	Air cooled compact RF generator.	
	b.	RF o/p power ≥300 W.	
	c.	RF o/p power regulation ≤ ±3%.	
	d.	Output frequency= 13.56 MHz.	
	e.	Output Frequency regulation ≤ ±0.005%.	
	f.	Output Impedance=50 ohms.	
	g.	Provision of safety interlocks in r/o closing of cover/enclosure, vacuum, cooling, pressure, etc.	
	h.	Harmonic Distortion ≤ -30 dB.	
	i.	Both local as well as remote (RS232/USB) operation modes are required.	
	j.	Both Continuous as well as pulsed modes of operations are required.	
	k.	15 pin D-type I/O control connector (DC input and output for power control and its monitoring).	
	l.	Front panel simultaneous display (LCD) of reflected and transmitted power for and set point power control, alarms, etc.	
	m.	'N' type female electrical connector for output power.	
	n.	RF Output cable (length 10 ft/3 m) appropriate to o/p connector on generator.	
	o.	Compatible Matching-Network unit capable for **wide range of impedance-matching** appropriate to sputtering-plasma applications (extra capacitors be	

		providing to enhance the impedance –matching capability at user end).	
	p.	Interconnecting RF-cables connecting the RF-generator and Matching network.	
7.	2" dia, 200 W rating **Sputter Magnetron Sources (Qty.:3):** *AJA* make **OR** having following technical specifications.		
	a.	Compatibility with RF as well as DC Sputtering.	
	b.	NdFeB modular magnet array.	
	c.	Clamping ring to hold down target.	
	d.	"N" type electrical connector.	
	e.	Fitted with electro-pneumatic shutter so as to protect the target from cross-contamination.	
	f.	Provision of Gas ring with conical chimney for uniform gas distribution.	
	g.	Compatibility with both magnetic and non-magnetic targets.	
8.	*MKS* or *Bronkhorst* or *Alicat* make NC type elastomer sealed **Mass Flow Controllers MFCs (Qty.: 3-4)** and the **display and control unit** for 3 channels or more simultaneously **(Qty.: 1)** complete with associated cables having 145 psig or higher inlet pressure and accuracy 0.1% of FS for following gases/flow ranges: The MFCs should be user configurable with regards to gas calibration, namely for Nitrogen (50 sccm), Oxygen (20 sccm), and Argon (20 sccm).		
9.	**Chamber venting with N_2 and Gas regulators (Qty. 6)**:		
	a.	In addition to venting by ambient air, provision must be made for manually venting the system with nitrogen gas via manual venting valve.	
	b.	The vendor has to supply 6 numbers of gas-regulators appropriate to the gas filled bottles (each having capacity equivalent to 7 m^3 water, and ~140 psi gas pressure).	
10.	**Residual Gas Analyser** (mass range: 1-200 amu) complete with cables and monitoring software, and CF to KF adaptor with clamps and rings etc. **(Qty.:1 Set):** *Pfeiffer* make or having following technical specifications: Maximum operating pressure $\geq 1\times10^{-5}$ mbar with Channeltron, and $\geq 1\times10^{-4}$ mbar with Faraday cup, Minimum detection limit of $\leq 5\times10^{-14}$ mbar with Channeltron, and $\leq 2\times10^{-11}$ mbar with Faraday cup.		
11.	**Substrate Biasing and power supply (Qty.: 1):** Provision for substrate biasing up to 100 V together with appropriate DC power supply for biasing is to be provided.		
12.	**Film Thickness monitor (Qty.:1):** A standard internationally proven model such as from *Edwards* or *Inficon* make or equivalent be provided together with all spares and connecting cables.		
13.	**3-way switches (Qty.:2)** for connecting the RF/DC power supplies to any of the 3 magnetron sources – one for RF-generator and other for DC-power supply.		
14.	**Safety interlocks (Qty.:1 set):** All safety interlocks with sound alarm and/or LED alarm/messages are to be provided for all the equipment components (e.g., vacuum, door, water, compressed air, electrical requirements, etc.) wherever required.		
15.	**Frame, panels and rack (Qty.: 1 set):** A convenient frame, panels and rack be used to mount all the above components to make it a reasonably compact sputter deposition system. The frame should have adjustable height for leveling and castors with stoppers for easy movements and rigid and stable operation of the system be provided.		
16.	**Water Chiller (Qty.:1):** Appropriate rating good quality and make closed-loop water chiller to be provided for taking care of all the needs of the system.		
17.	**Mandatory Accessories**		
	a.	Tool kit containing all the necessary tools (e.g., spanners, screw drivers, aligners, L-end key sets, needle file-sets, cutter, pliers, stripper, etc.) necessary for	

		sputtering system should be provided with the system. Tool kits as required for the servicing of the sub-systems like pumps, gauges, power supplies, sputter guns, etc. also to be provided.	
	b.	Vacuum grease of good quality (Dow Corning or equivalent make) should be provided along with the system.	
	c.	Viton gaskets: At least **10 sets** of spare viton gaskets wherever mounted are to be provided.	
	d.	A hair drier and compressed air gun nozzle (one each) be provided.	
	e.	Quartz crystals for Thickness Monitor (5 pcs).	
	f.	Suitable gas-plumbing lines and fittings from chamber to gas cylinder.	

I have also enclosed all relevant documents in support of my claims, (as above) in the following pages.

Signature of Bidder

Name : _____

Designation : _____

Organization Name : _____

Contact No. : _____

ANNEXURE-II

<< Organization Letter Head >>

DECLARATION SHEET

We, _____ hereby certify that all the information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I have gone through the specification, conditions and stipulations in details and agree to comply with the requirements and intent of specification.

This is certified that our organization has been authorized (Copy attached) by the OEM to participate in Tender.We, further certified that our organization meets all the conditions of eligibility criteria laid down in this tender document.

The prices quoted in the financial bids are subsidized due to academic discount given to IIT Delhi.

We, further specifically certify that our organization has not been Black Listed/De Listed or put to any Holiday by any Institutional Agency/ Govt. Department/ Public Sector Undertaking in the last three years.	NAME & ADDRESS OF THE Vendor/ Manufacturer / Agent
1 Phone	
2 Fax	
3 E-mail	
4 Contact Person Name	
5 Mobile Number	
6 TIN Number	
7 PAN Number	

(Signature of the Tenderer)

Name :

Seal of the Company

Bid Submission

i. Online Bid Submission :

The Online bids (complete in all respect) must be uploaded online in **Two** Envelops as explained below:-

Envelope – 1 (Following documents to be provided as single PDF file)			
Sl. No.	**Documents**	**Content**	**File Types**
1.	Technical Bid	Compliance Sheet as per Annexure – I	.PDF
2.		Organization Declaration Sheet as per Annexure - II	.PDF
3.			.PDF
4.			.PDF
Envelope – 2			
Sl. No.	TYPES	Content	
1.	Financial Bid	Price bid should be submitted in PDF format.	.PDF

Nancoscale Research Facility, Block VI,
Indian Institute of Technology Delhi
Hauz Khas, New Delhi-110016

Date : 03/02/2015

Subject :Purchase of Multi-target UHV and HV Sputtering Systems

S. No. (Same as in Technical Specification Table of NIQ)	Currency	Description of Item & Specification	Qty. in Units	Unit Price (a)	Agency Commission (b)	Discount (c)	Ex-works price (d=a+b-c)	Packing + Handling + DOC + Inland Frieght (e)	FOB Price (f=d+e)	Insurance + Frieght (g)	CIF Price (f+g)
1		Multi-target UHV and HV Sputtering Systems									

For indigenous items please quote as per following format.

S. No. (Same as in Technical Specification Table of NIQ)	Description of Item & Specification	Qty. in Units	Unit Price in Rs.	Excise Duty %	CST/VAT%	Octroi%	Total Price in Rs.
1.	Multi-target UHV and HV Sputtering Systems						
2.							