



**Indian Institute of Technology Kanpur**  
**Department of Materials Science and Engineering**

**Enq. No.:** MSE/SI/2015-16/IGSTC/DepSys/02

**Enquiry Date:** 14 July, 2015; **Closing Date:** 5 PM, 27 July, 2015

Quotations are invited for a **fully automated multi-target sputtering system with complete manual override capability** complying with or better than all of the specifications mentioned in **Appendix A**. The prospective suppliers are required to send quotation in two parts, each part sealed in a separate envelope. One part will be “Technical Bid” and second part will be “Financial Bid”.

**Terms and conditions**

1. Bidder must provide technical-bid using the file in **appendix B**, and financial-bid using the file in **appendix C**. Do not omit or rephrase any part of it. You may provide any additional technical information if it helps in technical evaluation of the offered system. If a bidder doesn't provide technical specifications and pricing in the format provided the corresponding bid will be rejected.
2. In the price bid, for all the indigenous parts the ex-works prices should be given, while for the imported items the bidder must provide price to have it delivered at New Delhi on CIP basis. **Note:** IIT Kanpur is registered with Department of Scientific & Industrial Research (DSIR) for purposes of availing customs duty exemption in terms of Government Notification No. 51/96-Customs dated 23 July, 1996, and Central Excise duty exemption in terms of Government Notification No. 10/97-Central Excise dated 1 March, 1997 as amended from time to time.  
In the case of incomplete information or missing information either in the technical-bid or the financial-bid the corresponding bid will be rejected.
3. In the technical-bid, the bidder must provide certificate (**use the format in appendix D only**) from at least three reputed academic institutes or research labs within India certifying the point (a), and at least one certificate from a reputed academic institute or research lab within India certifying the points (b) and (c). Also, send a copy of the Purchase Order (PO) corresponding to these certificates. The certificate must be carrying the name, signature, and seal along with complete address, phone number and e-mail address of the person who is providing the certificate so that a site visit could be planned.
  - (a) The bidder has already installed sputtering unit(s) during 2010 – June 2015, and it is functioning satisfactorily.
  - (b) The bidder has interfaced at least one sputtering/evaporation unit with glove box through CF flange during 2010 – June 2015, without any problems.
  - (c) For the arrangement mentioned in (b) above, the same bidder has also supplied a sample transfer mechanism which allows loading and unloading of the sample into the sputtering/evaporation system from the glove-box while no part of the sample transfer mechanism occupies any space inside the glove-box other than at the time of sample loading and unloading. The sample transfer mechanism does not require any part of it to be moved in and out of the glove-box through the antechambers every time a sample has to be loaded into and unloaded out of the sputtering/evaporation system from the glove-box. This mechanism has been successfully working at the Customer's site.
4. Besides providing the certificates mentioned in section no. 3 above, if the bidder has supplied sputtering unit(s) at IIT Kanpur during June 2010 – June 2015, then it must provide name of the contact person(s) corresponding to those labs/centres, complete mailing address, e-mail address, and contact phone number.

5. The Institute reserves the right to visit the site of any of the previous customer where a sputtering unit has been installed by any bidder participating in the present inquiry and take decision based on the evaluation of that system. If required the bidder should make arrangements for the site visit. The cost for the same will be borne by the indenter.
6. The system should have at least one year on site comprehensive warranty for all the indigenous parts. A separate warranty in the name of undersigned must be provided for all the imported parts.
7. The price bid must also show taxes, cost of packaging, delivery at IITK, insurance, installation and training, if any.
8. Validity of quotation should be at least for 60 days from the date of closing of the bid.
9. Quotation should carry proper certifications like agency certificate, authorization certificate, proprietary certificate if applicable, etc.
10. The bidder getting the purchase order will have to confirm the final details of the design before commencing the production. A final drawing in 3D is a must to understand the system in detail.
11. The technical-bid must have a statement comparing the specifications of the offered system against the required specification in the present enquiry.
12. **Installation, Commissioning and Training:**
  - a) The bidder getting the order will have to demonstrate on its site that the offered system satisfies the leak test with leak rate  $1.0 \times 10^{-10}$  Torr-liter/sec or less. Also it will have to show that the system achieves base pressure of  $5 \times 10^{-7}$  torr or lower at the Customer site.
  - b) The delivery will be considered complete only after successful commissioning of the instrument and when all indented parameters are met.
  - c) The pre-installation requirements should be communicated to IIT Kanpur well in advance of the installation.
  - d) The supplier should provide training to at least two candidates at the installation site to make them familiar with smooth operation of the instrument.
  - e) Documentations: One set of operating manual from the manufacturer of the sputtering unit. Other than this the User Manuals from OEMs of all individual units (and their parts if any), including all power supplies, the pumps, all MFCs, vacuum gauges, sputter-guns, all controllers including PID temperature controller etc. will have to be provided.
  - f) Successful operation of the unit using the standard recipe provided along with the system will have to be demonstrated.
13. Following payment term will be strictly followed irrespective of the terms mentioned by the bidder: 90% on delivery and 10% after installation and acceptance (for indigenous parts only).
14. The technical bid will be opened on 28 July 2015 at 3PM in the Office of Stores and Purchase Section at IITK. Interested bidders are welcome to participate. No intimation will be given in the case of change of venue due to unforeseeable case and the same will be displayed on the website.
15. The date of opening of financial bid will be displayed on the website. Interested bidders are welcome to participate.
16. The indenter will be available for in-person discussion about the inquiry related matter on 18 and 19 July 2015 during 10AM – 12Noon at the address given below.

The Technical and Financial bids may be sent in sealed envelopes to:

**Dr. Sarang Ingole**  
**Room No. 204, Western Labs Building**  
**Department of Materials Sciences and Engineering**  
**IIT Kanpur, U.P. 208016, India.**

### Appendix A

Sr. no	Part name	Description	Qty
<b>Essential Items</b>			
1	Deposition Chamber	<p>(A) Chamber should be made of non-ferromagnetic and non-corrosive stainless steel with inner surface polished.</p> <p>(B) The chamber must have easy access door through which inside of the chamber can be accessed for target change, cleaning of inside walls, removing and placing the liner plates.</p> <p>(C) Removable metal (SS) liner covering maximum possible inner surface area.</p> <p>(D) It should have ports for</p> <ol style="list-style-type: none"> <li>1. 3 Nos. of sputter guns in confocal arrangement and sputter-up configuration</li> <li>2. Port for interfacing the sputter system with the already existing glove box at the customer site. Note that the glove box has a CF150 flange on the left-hand-side of its wall.</li> <li>3. Port for connecting load-lock.</li> <li>4. 2 Nos. of View ports with shutter to be able to see the substrate and the sputter sources</li> <li>5. ports for gauges</li> <li>6. Port for sample holder assembly</li> <li>7. Vent port</li> <li>8. Ports for both the vacuum pumps</li> </ol> <p>(E) Blanks for sealing off the ports in the case of repair/replacement of parts attached to them.</p>	1
2	Sputter Guns	<ol style="list-style-type: none"> <li>1. Capability of mounting targets of 1 (one) and 2 (two) inch diameter, and 1/8 and 1/4 inch thickness.</li> <li>2. High power rare earth magnets which are easily removable and indirectly water cooled.</li> <li>3. Each gun will have a chimney with pneumatically operated shutter. It should be possible to actuate it using pressurized nitrogen from a gas-cylinder.</li> <li>4. A gas release ring in each of the guns right next to the target is required for local delivery of the sputtering gas.</li> <li>5. It must be possible to initiate and stabilize plasma in the localized region inside the chimney in between the shutter (in closed position) and sputtering target.</li> <li>6. Each gun must be compatible for both DC as well as RF power supply.</li> <li>7. Each gun must have power rating of at least 300W.</li> <li>8. For each of the three guns it must be possible to move the sputter-targets backward and forward in order to adjust their distance from the substrate holder without changing the focal point (the substrate).</li> </ol>	3
3	Sample holder assembly with removable sample holding chuck	<ol style="list-style-type: none"> <li>1) Capability to heat the substrate up to 600°C in the increment of 10°C with temperature uniformity equal or better than <math>\pm 5^\circ\text{C}</math>. <ul style="list-style-type: none"> <li>• Temperature of the substrate holder chuck needs to be measured using thermocouple and controlled using a PID temperature controller.</li> <li>• The PID controller must have necessary display for indicating substrate temperature, and it must be equipped for communication with and control using a computer using a software. It must be possible to control the heating and cooling rate of the substrate (heating and cooling rate as low as 5°C/min is required) by specifying the heating/cooling rate on the PID temperature controller.</li> </ul> </li> </ol>	1 assembly

		<ul style="list-style-type: none"> <li>• Specify the type of thermocouple being used and provide its calibration certificate.</li> <li>• Provide the make and model number for the PID controller. The bidder must also provide the technical specification documentation from the OEM of the PID temperature controller</li> </ul> <p>2) Sample rotation at least 5 RPM</p> <p>3) Substrate biasing capability using DC power supply while rotating / heating / depositing</p> <p>4) There must be a pneumatically operated shutter to prevent/stop deposition on the substrate.</p> <p>5) A removable gas release ring (rectangular or circular) or an arrangement around the substrate holder so that oxygen could be supplied in the vicinity of the substrate during deposition. It should not restrict the rotation or heating of the substrate.</p> <p>6) A gas-supply port on this assembly for supplying oxygen in the vicinity of the substrate as mentioned in point no. 5 above. It could also be on the vacuum chamber, instead.</p> <p>7) 3 (three) removable sample holder chucks (non magnetic material) able to hold 2 inch x 2 inch or smaller substrate are required which can be transferred between the sputtering system and glove box. It should be thick enough (5 mm at least) so that holes could be drilled in it for placing a shadow mask in front of the substrate using small screws.</p>	
4	RF power supply with auto matching network	<p>300W at 13.56 MHz RF supply with auto matching network along with all the necessary controllers, and cables. Suitable for sputtering and capable of automation.</p> <p><b>Advanced energy, Serene, T&amp;C conversion USA make or equivalent</b></p> <ul style="list-style-type: none"> <li>• It should have an active front panel control so that it could be operated manually other than being operated through computer control.</li> <li>• Should operate in Class B or AB mode only.</li> <li>• Capability for regulating power output using different control modes: DC Voltage, RF Voltage, Forward Power and Load Power Levelling.</li> <li>• Protection against excessive VSWR condition</li> <li>• Programmable pulsing</li> <li>• Solid State Microprocessor Controlled.</li> <li>• Air Cooled version with Internal DC switcher - 190-264 VAC, Single Phase.</li> <li>• Compliance with the SEMI standards or conformity with EC Declaration (CE marking) for health and safety. With the technical-bid a certificate or the literature available from the OEM which confirms the required compliance must be supplied.</li> </ul>	1
5	DC/RF switch box	<p>Computer controlled switch-box with appropriate cables to switch connection between RF power supply and the three sputter magnetron guns. This allows switching RF power supply between the three sputter guns to sputter 3 different targets one after other.</p>	1
6	Turbo Molecular Vacuum pump	<p>At least 600 l/sec for nitrogen gas.</p> <p>PFEIFFER Hipace 700 (without any prefix after 700) or equivalent having service centers in India</p> <ul style="list-style-type: none"> <li>• International Protection Rating or Ingress Protection (IP) Rating must be at least 54 or better.</li> <li>• Run-up time must be 2.5 minutes or less</li> </ul>	1

		<ul style="list-style-type: none"> <li>• Splinter shield</li> <li>• Equipped for computer control.</li> <li>• The orientation of the pump in the offered unit must be within the suitable orientation for the operation of pump as specified by the OEM.</li> <li>• The offered pump must have SEMI certification. With the technical-bid a certificate or the literature available from the OEM which confirms the required compliance must be supplied.</li> <li>• The bidder must attach a valid certificate from the OEM for the offered pump which should clearly say that “The Turbo molecular pump (<i>model name here</i>) from (<i>OEM name here</i>) can be completely repaired in India. Neither the pump nor any part of it needs to be sent outside India for repair.”</li> </ul>	
7	Roughing Vacuum Pump	<p>Adixen ACP 15 dry pump with auto shut-off valve or equivalent as backing pump.</p> <ul style="list-style-type: none"> <li>• Air cooled</li> <li>• With gas ballast</li> <li>• The offered model must have SEMI certification. With the technical-bid a certificate or the literature available from the OEM which confirms the required compliance must be supplied.</li> </ul>	1
8	Vacuum gauges With cables and display	<p>PFEIFFER Vacuum, Instrutech (USA) or equivalent vacuum gauges for high vacuum and process pressure measurement, and equipped for computer control.</p> <p>Hi-vacuum sensor:</p> <ul style="list-style-type: none"> <li>• Cold cathode Pirani Gauge</li> <li>• Measurement range at least 750 Torr – <math>5 \times 10^{-9}</math> Torr</li> <li>• Response time 10ms or better</li> <li>• Ingress protection rating IP54 or better</li> <li>• Insensitive to gas inrush</li> </ul> <p>Process pressure measurement:</p> <ul style="list-style-type: none"> <li>• Method of measurement: Capacitance</li> <li>• Ceramic based membrane and measuring chamber</li> <li>• Measurement range at least 1.0 Torr – <math>1.0 \times 10^{-4}</math> Torr</li> <li>• Resolution 0.003 %Full Scale.</li> <li>• Response time 30ms or better</li> <li>• Ingress protection rating IP30 or better</li> </ul>	1 set
9	Gate valve for turbo pump	<p>UHV compatible gate valve having bellow sealed shaft movement for separating chamber and turbo pump.</p> <ul style="list-style-type: none"> <li>• Equipped for computer control.</li> </ul>	1
10	Gate valve at the interface with Glove-box	<p>Manually operated UHV compatible gate valve having bellow sealed shaft movement for separating chamber and the glove-box. Note that the gate-valve will have to interface with CF150 flange on the glove-box.</p>	1
11	Vent valve	<p>Vent valve with N<sub>2</sub> vent (bellow sealed manual valve)</p> <p>It should allow venting the vacuum chamber either using the gases inside the glove-box, or gases from an Argon/nitrogen cylinder.</p>	1
12	MFC	<p>Alicat , USA or equivalent digital mass flow controller for 0-100 SCCM flow with the inbuilt display or the display provided by same OEM.</p> <p><b>Four numbers of MFCs for Non-corrosive gases for 0-100 SCCM flow</b>  <b>One number of MFC for corrosive gas for 0-100 SCCM flow</b></p>	5

		<ul style="list-style-type: none"> <li>• All of these MFCs must allow user to define at least 10 different gas compositions with up to 5 constituent gases per mix.</li> <li>• Ingress protection rating IP40 or higher</li> <li>• Warm up time &lt; 1 second</li> <li>• Response time 100 ms or less. It must be adjustable.</li> <li>• The display must simultaneously show mass and volumetric flow, pressure and temperature. It must have been pre-calibrated for different gases by the OEM.</li> <li>• It should allow switching to different gases by selecting options right on the display without requiring any computer control.</li> <li>• The MFC must come along with the software supplied by the same OEM, and it must be equipped for computer control.</li> </ul>	
13	Frame	Rust resistant support frame for the sputtering system with levelling feet	1
14	Instrumentation rack	Rust resistant support frame for mounting all the electronics and controls. <ul style="list-style-type: none"> <li>• It must have caster wheels along with wheel locking arrangement.</li> </ul>	1
15	Interfacing with glove-box along with sample transfer mechanism	<p>Sputtering Unit will have to connect with the already existing glove box at the customer site. Also, a sample transfer mechanism will have to be provided along with the sputtering system which will enable sample loading into the sputtering unit from the glove-box and unloading from the sputtering unit right into the glove-box. The bidder will have to supply all the parts required for interfacing as well as the sample transfer mechanism.</p> <p>Provide a complete drawing on a <b>Compact Disk (CD) only</b> as per the requirements below.</p> <p><b>Drawing No. 1:</b> It should show sputter deposition system interfaced with the glove-box with all necessary dimensions. Note that the CF 150 flange on the glove-box is on the left-hand-side wall when observed by a user working at the glove-box, and at 1170 mm height from the laboratory floor. The design of sputtering unit will have to take this fact into account.</p> <p><b>Drawing No. 2:</b> It will show only the sputtering system where all the ports on the vacuum chamber and parts attached to the ports will be shown. Provide different views for this purpose so that no part of it outside as well as inside remains hidden.</p>	
16	Automation	<ul style="list-style-type: none"> <li>• Complete automation will include all necessary hardware and software that would allow creating, saving, and executing deposition recipes.</li> <li>• A standard recipe will have to be provided along with the system. It will be used to check full operation as well as automation for the ordered system.</li> <li>• Following safety interlocks are required for following: <ol style="list-style-type: none"> <li>(1) Water flow to each of the sputter guns.</li> <li>(2) To prevent accidental increase in power level from power supplies (may be due to malfunction).</li> <li>(3) Vacuum level inside the chamber. In the case of vacuum compromise the gate valve to the turbo pump should close as soon as possible.</li> <li>(4) Sample temperature overheat protection.</li> <li>(5) If the door to the chamber or any of the gate valve is open none of the pumps should operate, none of the power supply should operate.</li> </ol> </li> </ul>	

		<p>It should be possible to control the thickness of the deposited films via both, the data from thickness monitor during the deposition, or controlling the On timing of the power-supplies which the User provides as an input into the software at the time of making a deposition recipe.</p> <p>The very first steps of bringing the chamber to base pressure with roughing followed by the turbo-pump will be completely manual. Also the venting of the chamber will be manual.</p>	
17	Thickness monitor	<p>1 set of thickness monitor along with all necessary cables, ports, controller, and display.</p> <p>It must be possible to provide thickness-data from thickness monitor to the automation software so that On-time for any of power supplies and hence the deposition-time could be controlled. Provide at least 5 additional quartz crystals.</p>	
<b>Desirable items</b>			
18	Load Lock with transfer arm	For the sample transfer	1
19	Gate Valve	Manually operated UHV compatible gate valve having bellow sealed shaft movement	1
20	Additional RF power supplies of same specs as that mentioned in the serial no. 4 above.		2
21	<p>Additional vacuum chamber of same specs as that mentioned in the serial no. 1 above with following points to be noted:</p> <ol style="list-style-type: none"> <li>(1) Sputtering will be performed only in one of the chambers at a time.</li> <li>(2) It will be fitted with the diffusion pump inquired in serial no. 26 of this inquiry letter.</li> <li>(3) It will use the same roughing pump, RF power supplies, MFCs used for chamber indicated in serial no. 1 above.</li> <li>(4) Indicate if same set of gauges mentioned in serial no. 9 can be used for this second chamber.</li> </ol>		1
22	Additional sputter guns of same specs as that mentioned in the serial no. 2 above.		3
23	<p>A water cooled chiller to support all the cooling requirements of the deposition system.</p> <p><b>Only one system will be operated at a time in case a second vacuum chamber is orders.</b></p> <p><b>Note: Its cooling capacity should be such that it can support the cooling requirements of fully fledged system including 3 sputter guns, diffusion or Turbo whichever has higher heat load, 3 RF power supplies each of 300 Watt, sample holder and all other which require cooling.</b></p> <ul style="list-style-type: none"> <li>• Indicate the cooling capacity and total water holding capacity.</li> <li>• Ports for water fill, drain, and chilled water out and return along with valves at each port. At chilled water outlet port a pressure gauge and flow meter must be provided.</li> <li>• All parts including the screws coming in contact with the recirculating water must be corrosion free.</li> <li>• It must have controller with digital display to set the temperature, and read the temperature of the water.</li> <li>• The refrigeration unit of the chiller must be using eco-friendly coolant such as R-134A.</li> </ul>		
24	<p>Online UPS to support the essential operations of the system for at least 30 minutes such as both the vacuum pumps, the chiller (take care of the note mentioned in serial no. 23 above) supplying water to the sputtering guns and anything which can get damaged or can be damaging to any part of the system in the case of power failure.</p>		

	<p><b>Only one system will be operated at a time in case a second vacuum chamber is orders.</b></p> <p><b>Note: Its capacity should be such that it can support running the entire system including the chiller for at least 30 minutes other than the power supply and sample heating.</b></p> <ul style="list-style-type: none"> <li>• UPS must be based on dry batteries only.</li> <li>• The UPS must be CE marked.</li> </ul>
25	Set of Additional O-rings, copper gaskets etc. necessary for vacuum-tight joints/seals at each of the ports (at least 5 sets)
26	Diffusion pump instead of turbo pump for creating high vacuum in the vacuum chamber  HHV made VS 150D or equivalent
27	1 additional set of thickness monitor identical to that in serial no. 17 above.

**Note:**

1. All the components must come along with all the necessary cables, controllers, displays, ports etc. Necessary for its intended function.
2. For all the offered third party parts including chiller and UPS, a copy of the technical-specification/data-sheet available with the OEM must be provided. These documents corresponding to any of the units must also verify the technical requirements indicated in this inquiry letter for that unit. These technical specifications/data-sheets must also be available at the OEM website.
3. The offered model(s) must not be a discontinued item by the OEM at the time of bidding. The offered model must be displayed in the products category on the website of OEM.

-----End of Appendix A-----



**Appendix B**  
**Format in which the Technical Bid must be submitted**

**Note:**

- A cell in the following Form may be resized in order to accommodate the required information.
- A space has been provided to supply any additional information.

Sr. no	Part name		Qty	
<b>Essential Items</b>				
1	Deposition chamber	Chamber description	1	
		Port description (Mention all the ports)		1. .... 2. .... 3. .... 4. .... 5. .... 6. .... 7. .... 8. .... (Add more entries as per the requirement)  Next to the port description also indicate if a Blank has been included
		Metal Liner description		
		In the space provided below list any additional information about the chamber, or the related document that you have provided as a part of the technical-bid.		
2	Sputter Guns	Confocal arrangement with sputter-up configuration	(Yes or No)	
		Dimensions of the compatible sputter target(s)	Diameter:  Thickness:	
		Magnets on each of the three guns	<ul style="list-style-type: none"> <li>• Modular: (Yes or No)</li> <li>• Magnets are indirectly water cooled: (Yes or No)</li> <li>• Rare earth magnets: (Yes or No)</li> </ul>	
		Chimney on each of the guns	(Yes or No)	

		Shutter	<ul style="list-style-type: none"> <li>Will there be shutter on each sputter gun?</li> </ul> Response: <ul style="list-style-type: none"> <li>Will the shutters be pneumatically operated?</li> </ul> Response:	
		Gas ring	<ul style="list-style-type: none"> <li>Will there be gas ring with each sputter gun for delivery of sputter gas (argon) in the vicinity of the sputter target inside the chimney?</li> </ul> Response:	
		Localized plasma generation	<p>Will it be possible to initiate and stabilize the plasma in the localized region inside the chimney while the shutter for the corresponding gun is in closed position?</p> Response:	
		Compatibility with DC and RF Power supply	<ul style="list-style-type: none"> <li>Will each of the three sputter guns be compatible with DC as well as RF power supply?</li> </ul> Response:	
		Power rating for each of the 3 sputter guns	Response:	
		Distance between sputter target and the substrate	<ul style="list-style-type: none"> <li>Is it adjustable?</li> </ul> Response: <ul style="list-style-type: none"> <li>Will it be adjustable by substrate holder movement and target angle adjustment, or movement of guns?</li> </ul> Response:	
		<p>In the space provided below list any additional information about the sputter guns, or related document that you have provided as a part of the technical-bid.</p>		
3	Sample holder assembly with removable sample	Substrate size→	<p>Maximum substrate size that can be loaded:</p> <p>Can smaller pieces be loaded and if so whether the attachments required are provided?</p> Response:	1 assembly

holder chuck	Substrate heating →	<p>Maximum temperature to which the substrate could be heated:</p> <p>Temperature uniformity:</p> <p>Smallest temperature increment possible:</p> <p>Smallest heating rate and cooling rate possible:</p> <p>Temperature measurement method :</p> <p>Temperature controller :</p> <ul style="list-style-type: none"> <li>• Make:</li> <li>• Model No. (with all prefixes):</li> </ul> <p>Is it going to be supplied with the software from the OEM of the controller:</p> <p>Is it equipped for communication and control through computer using OEM provided software (Yes or No):</p>
	Maximum Substrate rotational speed (RPM) →	
	Substrate biasing →	<p>DC biasing while rotating, heating, and depositing on the substrate</p> <p>Response:</p>
	pneumatically operated shutter in front of the substrate holder →	(Yes or No)
	removable sample holder chucks →	(Yes or No)
	A removable gas release ring or an arrangement for the same around the substrate holder →	<p>Response:</p> <p>Location of the port on the system for supplying this gas: (Chamber or the sample holder assembly?)</p> <p>Response:</p>
	In the space provided below list any additional information about the substrate holder, or related document that you have provided as a part of the technical-bid.	

4	RF power supply	<p>Mention below the Make and Model No. (with all prefixes) for all the parts included in the offer:</p> <p>Is it equipped for communication and control using computer (Yes or No):</p> <p>In the space provided below list any additional information about the RF supply, or related document that you have provided as a part of the technical-bid.</p>	1
5	DC/RF switch box	<p>Make:</p> <p>Computer controlled (Yes or No):</p> <p>Allows switching between power supply and three sputter guns (Yes or No):</p> <p>In the space provided below list any additional information about the switch, or related document that you have provided as a part of the technical-bid.</p>	1
6	Turbo Molecular Vacuum pump	<p>Mention below the Make and Model No. (with all prefixes) for all the parts included in the offer:</p> <p>Is it equipped for communication and control using computer (Yes or No):</p> <p>In the space provided below list any additional information about the pumps, or related document that you have provided as a part of the technical-bid.</p>	1

7	Roughing Vacuum Pump	<p>Mention below the Make and Model No. (with all prefixes) for all the parts included in the offer:</p> <p>Gas ballast included (yes or no):</p> <p>Is it equipped for communication and control using computer (Yes or No):</p> <p>In the space provided below list any additional information about the roughing pumps, or related document that you have provided as a part of the technical-bid.</p>	1
8	vacuum gauges along with all cables	<p>Mention below the Make and Model No. (with all prefixes) separately for all the different gauges and respective parts included in the offer:</p> <p>Gauge No. 1:</p> <p>Gauge No. 2:</p> <p>(Add more entries if applicable)</p> <p>Are these equipped for communication and control using computer (Yes or No):</p>	1 set
9	Gate valve for turbo pump	<p>Make:</p> <p>UHV compatible (Yes or No):</p> <p>bellow sealed shaft movement (Yes or No):</p> <p>Is it equipped for communication and control using computer (Yes or No):</p>	1

		In the space provided below list any additional information about the gauge and valve, or related document that you have provided as a part of the technical-bid.	
10	Gate valve at the interface with Glove-box	<p>Make:</p> <p>UHV compatible (Yes or No):</p> <p>bellow sealed shaft movement (Yes or No):</p> <p>Can be interfaced with the CF150 flange on the glove-box(Yes or No):</p> <p>In the space provided below list any additional information about the valve, or related document that you have provided as a part of the technical-bid.</p>	1
11	Vent valve	<p>bellow sealed manual valve (Yes or No):</p> <p>Does it allow venting the vacuum chamber either using the gases inside the glove-box, or gases from an Argon/nitrogen cylinder (yes or no):</p>	1
12	MFC	<p>Mention below the Make and Model No. (with all prefixes) for all the parts included in the offer:</p> <ul style="list-style-type: none"> <li>• MFC for non-corrosive gases (4 MFCs):</li>   <li>• MFC for corrosive gases(1 MFC):</li> </ul> <p>OEM supplied software included (yes or no):</p> <p>Digital display having controls from same OEM (Yes or No):</p> <p>equipped for communication and control using computer (Yes or No):</p> <p>In the space provided below list any additional information about the MFC, or related document that you have provided as a part of the technical-bid.</p>	5







**List of the document that have been sent in the envelop titled Technical-bid**

1. Appendix B
2. Certificate **(use the format in appendix D only)** from at least three reputed academic institutes or research labs within India certifying the points (a) to (c) of **Terms and Conditions** mentioned in the inquiry letter.
- 3.
- 4.

(Add more entries as required)

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----- **End of Appendix B** -----

**Appendix C**  
**Format in which the Financial Bid must be submitted**

Sr. no.	Part name	Qty	Mention the cost in this column if offering a part as an indigenous item (Ex works)	If imported item, mention the cost in this column on CIP New Delhi term
<b>Essential Items</b>				
1	Deposition chamber	1		
2	Sputter Guns	3		
3	Sample holder assembly with removable sample holder chuck ( <b>1 assembly with 3 chucks</b> )	1		
4	RF power supply	1		
5	DC/RF switch box	1		
6	Turbo Molecular Vacuum pump	1		
7	Roughing Vacuum Pump	1		
8	Vacuum gauges			
	Gauge No. 1:	1		
	Gauge No. 2:	1		
	(Add more rows & columns in this section for gauges if required)			
9	Gate valve for turbo pump	1		
10	Gate valve at the interface with Glove-box	1		
11	Vent valve	1		
12	MFCs			
	Non corrosive gases	4		
	Corrosive gases	1		
13	Sputtering system support frame	1		
14	Instrumentation rack	1		
15	Interfacing with glove-box along with the sample transfer arrangement (Provide separate cost for interfacing and sample transfer arrangement)	Interfacing		
		sample transfer arrangement		
		1		

16	Complete automation (Provide separate cost for hardware and software)	Hardware		
		Software		
17	Thickness monitor	1 set		
Desirable items				
18	Load Lock with transfer arm	1		
19	Gate Valve	1		
20	Additional RF power supplies	2		
21	Additional vacuum chamber	1		
22	Additional sputter guns	3		
23	Water cooled Chiller	1		
24	Online UPS	1		
25	Set of additional O-rings, copper gaskets etc. necessary for vacuum-tight joints/seals at each of the ports	5 sets		
26	Diffusion pumping system	1		
27	Additional thickness monitor	1 set		
		<b>Subtotal (A)</b>		
	Taxes			
	Packaging			
	Delivery at IITK			
	Insurance			
	Installation			
	Training			
Mention below any other cost, if any.				
		<b>Subtotal (B)</b>		
		<b>Grand Total (A+B)</b>		

-----End of Appendix C-----

## Appendix D

Format in which the certificate must be provided  
(Strike off the statement which is not applicable)

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Date

### To Whom It May Concern

(a) This is to certify that (*Bidder name here*) has installed a multitarget sputtering system in our facility (facility name along with the Institute name) on (*Date here with the year*), and it is functioning satisfactorily.

### and/or

(b) This is to certify that (*Bidder name here*) has interfaced at least one sputtering/evaporation system with a glove box through CF flange at our facility (facility name along with institute name) on (*Date here with the year*), and it is functioning satisfactorily.

(c) For the arrangement mentioned in (b) above, the same bidder has also supplied a sample transfer mechanism which allows loading and unloading of the sample into the sputtering/evaporation system from the glove-box while no part of the sample transfer mechanism occupies any space inside the glove-box other than at the time of sample loading and unloading. The sample transfer mechanism does not require any part of it to be moved in and out of the glove-box through the antechambers every time a sample has to be loaded into and unloaded out of the sputtering/evaporation system from the glove-box. This mechanism has been successfully working at the Customer's site.

Full address of the facility where the mentioned unit is currently located (a site visit should be possible):

Address:

Signature with seal and date :

Name :

Position :

Contact Phone (Office) :

e-mail address :

Affiliation :