Indian Institute of Technology Delhi
Centre for Energy Studies, Hauz Khas, New Delhi-110016, India

NOTICE INVITING QUOTATION

Date: 13th December, 2012

Due date: 26th December, 2012

NIQ Ref. No.: IITD/CES/CORP/2012-13/Physical Vapor Deposition system for solar cell applications

Sealed quotations are invited for fabricating **A Stainless Steel Cylindrical Chamber for clean vacuum environment work at base pressure < 2 ×10^{-6} Torr** and a quick pump down cycle, consisting of following items **as per the indicated specifications and** desirable features.

	Item	Specifications	No.	Remarks
1	SS cylindrical Chamber for clean vacuum	300mm diameter 400mm tall cylindrical chamber Ports for 3 no's electrodes (boats/filaments), port for thickness monitor, port for turbo molecular pumping 100-ISO-K through Gate value (see below) , KF25 Port for Rotary Pumping, port for sample holder/substrate heater, KF25 port for thermocouple, 8 inch X 10 inch size front door with view port for sample loading and charge loading, gauge ports (one KF 25, one KF 16), KF type air inlet port with air inlet valve, port for desired gas inlet (APPROPRIATE TO MASS FLOW CONTROLLER), two additional ports KF 25 with blank off for future applications **(The vendor MUST include the cost of appropriate numbers of Viton O-rings, SS Centering Ring, SS KF clamps for every port. Else quotation will not be considered any further)**	1	For Physical Vapor Deposition (Attainable base pressure < 2 ×10^{-6} Torr)*.
2.	Electrodes, Transformer & Variac	100 amps capacity copper electrodes for holding boats or filaments with appropriate Variac complete with the appropriate ammeter and transformer	3	Boat length of ~ 4-5 cm. The shutter operation should be controlled manually from outside.
3.	Gate valve	Gate valve 100-ISO-K compatible	1	Operation of gate valve manually from outside.
4.	Sample holder with substrate heating assembly, and	1. Circular SS disk of 6 inch diameter or square SS plate of 6X6 inch is required 2. Up and down movable ±1 inch heating assembly size should be of 4X4 inch	1	Manually movable (up and down) substrate holder 10 to15 cm above the boat assembly. Ports size of 2 cm diameter (Frequent

	shutter	3. Substrate Temperature ≥ 600 degree C. 4. PID temp controller with precision of ±1 degree C. 5. Provision for multiple substrate mounting is required. 6. Manually operable shutter		removal of the substrate stage is desirable) Substrate preferably facing down.
5.	Thickness monitor	High precession water cooled thickness monitor with digital display. The rate of the deposition also should be controlled by the thickness monitor.	1	Thickness monitor with minimum thickness ~0.1nm and deposition rate ~0.01nm/S is desirable. Details of the quoted monitor should be provided with the brochure.
6.	Right angled SS bellow type valve	Both ports should be KF 25 type	3	
7	Flexible SS vacuum hose with KF25 ends	Length of 1 meter Length of 0.5 meter	2 1	
8.	Mass Flow Controller	Precise mass flow controller with digital display, calibrated for Argon gas, Full scale range of 50 sccm with an accuracy of ≤ 2%	1	------
9.	Electrodes for plasma assembly	Electrodes to hold Tungsten filament(cathode) and a Copper anode	1	Plasma electrode assembly is placed between substrate holder and evaporation boats. Plasma is created between Tungsten cathode and Copper anode above the boat, through which evaporation takes place. Arrangement for frequent removal of Tungsten filament is needed.
10.	Power supply for plasma assembly	DC Voltage for anode is ~1000 V and Current supply to Tungsten filament is 1 A.	1	
11.	Stand/rack	Current and voltage supply to create plasma, Provision for mounting the Pressure measuring/ displaying unit/TMP controller/MFC display unit, PID controller, Ammeter display	1	

Important:

[1]. COMPLETE DRAWING TO BE SUBMITTED FOR APPROVAL BEFORE START OF THE FABRICATION.

[2]. IN CASE THE DESIGN IS TECHNICALLY NOT SOUND, IT WILL BE A BASIS OF THE REJECTION OF THE QUOATE.

[3]. CLARIFICATION, IF ANY, REGARDING SPECIFICATION/DESIGN SHOULD BE SOUGHT BEFORE MAKING THE OFFER.

*** Before the shipping of the system, it will be inspected for the above vacuum quality at vendor's works. The payment shall be made only subject to similar demonstration of vacuum at the time of installation at IIT Delhi.**

TERMS and CONDITIONS:

1. **Prices:** The prices quoted must include charges for delivery at IIT Delhi.
2. **Validity period:** Submitted quotations should clearly mention the validity period, preferably for a minimum of **2 months**.
3. **Delivery period:** The delivery period should be clearly indicated in the quotation.
4. **Payment terms:** 'The payment after delivery' subjected to satisfactory installation.
5. **Authorisation:** In case, the quotation is being submitted by authorized agent of the principal manufacturing company, a **latest authorised sales/agencyship certificate** issued from the PRINCIPALS should be furnished along with the quotation. **Quotations without this authorization certificate will be rejected.**
6. **Proprietary Certificate**: If the quoted items are proprietary, the quotation must be submitted by enclosing the proprietary article certificate stating clearly the following statement: **"Certified that_____is a proprietary item of M/s_____and no other manufacturer make these items."**
7. **Warranty:** The quotation should include comprehensive warranty statement.
8. **Special discount** Special discount/rebate wherever admissible keeping in view that items are being procured for educational purpose in respect of Public Institution of national importance may please be indicated.
9. **Brochure/leaflet:** Vendors must attach the relevant brochure/leaflet for the models/options quoted.
10. Technical and financial bids must be submitted in separate sealed envelopes, both then should be placed in another sealed envelope marked as ""IITD/CES/CORP/2012-13/Physical Vapor Deposition system for solar cell applications**"** should reach the undersigned on or before December **26, 2012.**
11. Institute reserves the right to accept/ reject all/ any quotation without assigning any reason thereof.
12. Incomplete and conditional submitted tenders would be summarily rejected.

(Dr. Vamsi K. Komarala)
Block V, Room No. 350 B
Centre for Energy Studies
IIT DELHI, NEW DELHI-110016, INDIA
E-mail: vamsi@ces.iitd.ac.in