



Telephone: 22574479 [EN]

Extn.

Department of Electrical Engineering
Indian Institute of Technology, Madras
I.I.T.P.O., MADRAS - 600 036.

Ref. No.

ELE	DEBD	2016	Fabricate a functional thin film Co-evaporation system.
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Date: 06/06/2016

Under certificate of posting

O/c

DUE Date: 20/6/16

Dear Sirs,

1. Quotations are invited in duplicate for the various items shown below/overleaf/enclosed list.
2. The Quotations duly sealed and superscribed on the envelope with the reference No. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. The Quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
4. If the item is under DGS & D Rate contract, Rate Contract Number and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate Contract price. If so, please send copy of the R.C. (Please note that we are not Direct Demanding Officers).
5. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable.
6. Local Firms: Quotations should be for free delivery to this Institute. If Quotations are for Ex-Godown delivery charges should be indicated separately.
7. Firms outside Chennai: Quotations should be for F.O.R Chennai. If F.O.R. consignor station, freight charge by passenger train/lorry transport must be indicated. If Ex-Godown, packing, forwarding and freight charge must be indicated.
8. The rate of Sales/General Taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, claim for Sales/General Taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have Concessional Sales Tax applicable to non-Government Educational Institutions run with no profit motive for which a commission. Sales Tax certificates will be issued at the time of final settlement of the bill.
9. Goods should be supplied carriage paid and insured.
10. Goods shall not be supplied without an official supply order.
11. Payment: Every attempt will be made to make payment within 30 days from the date of receipt of bill/acceptance of goods, whichever is later.

specification is enclosed and quotation to be sent below address.

DR. DEBDUTTA RAY
ASSISTANT PROFESSOR
MICROELECTRONICS & MEMS LAB
ELECTRICAL ENGINEERING DEPARTMENT
IIT MADRAS
CHENNAI - 600036.

Yours faithfully,

HEAD / Project Co-Ordinator

Fabricate a functional thin film co-evaporation system with custom designed load-lock with the following specifications (note: turbo molecular pump (TMP), backing pump, cold cathode and Pirani gauge will be provided by IIT Madras):

Sl. No.	ITEM	SPECIFICATIONS/FEATURES
1	Vacuum chamber	<ul style="list-style-type: none"> • Made out of non-magnetic SS grade, AISI-304L • Chamber having dimension 450mm (Ø) X 500mm (H) • One high vacuum compatible, toughened glass view port (150mm diameter for the glass) • Two numbers of side ports (inner diameter 50mm) • One set of thin stainless steel sheet liner to prevent the deposition on the chamber wall • Chamber must be provided with ports to connect to turbo pump (DN 160, ISO - KF), rotary pump and gauges • Chamber must also be provided with ports for evacuation, vacuum measuring gauge heads, gas feeding valves, etc. • Chamber base plate must be provided with necessary required feed through ports for mounting, shutters etc. • Top plate must be attached to the substrate heater with four pillars at its centre • Top plate must have feed throughs for the heater and one thermocouple (4 electrical points) • Ten or twelve pure copper evaporation source stands (with vacuum feed through) must be provided where the source boats will be screwed on. • Top cover and chamber must have slots for alignment. • Pressure < 10^{-7} Torr (should be demonstrated) • Bottom plate must be provided with electrical feed throughs with white LED lighting.
2	Substrate holder	<ul style="list-style-type: none"> • Substrate holder is a rectangular box having 78mm L, 43mm W and 12mm H, which can hold four substrates of 1"X0.5" dimension • It has four slots of 27mm L, 14mm W and 5mm depth, in which samples are placed. • It also has the provision to screw a pull rod having 8mm Ø and 750mm L on one end. • Substrates are held by using a top cover, which is a 68mmX43mm stainless steel plate having a rectangular hole of 64mmX21mm on it, which is screwed on the substrate holder at its four corners. • Top cover has a rail on it, through which the mask-plate can be moved • Top cover must not occupy more than 1mm space in between mask and substrate

3	Mask plate and mask mover rod	<ul style="list-style-type: none"> • Mask plate (assembly of three shadow masks) is a stainless steel plate having 1mm thickness, 222mm L and 27mm W (Length includes a T-shaped extension for locking to the mask mover). • Mask is moved with respect to the substrate holder by using a rod (mask mover) having 8mm Ø and 350mm length. • Mask mover comes from one side port (opposite to the one from which substrate and mask come in). This side port must have a 50mm cylindrical extension (with 10mm Inner Ø) having two vacuum seals on both ends to provide additional support for rod. • Mask mover has a locking system on its tip and this tip is always inside the chamber.
4	Chamber Gadgetry	
(a)	Wires and electronics for source heating	<ul style="list-style-type: none"> • Four LT evaporation wires • Made out of electrolytic pure copper having 200Amps current carrying capacity • Two power supplies (200A) for heating the sources.
(b)	Chamber gadgetry on the bottom plate	<ul style="list-style-type: none"> • A stainless steel mesh filter covering the pumping port to protect the turbo molecular pump from entry of unwanted particles • A dummy plate made out of SS is mounted above the mesh filter & fixed to the base plate using three/four pillars
5	Vacuum system	
(a)	Gate valve (2 No.)	<ul style="list-style-type: none"> • DN 160 ISO - KF main gate valve (used with turbo molecular pump) (1 No.) • 50mm inner diameter gate valve (used with load lock) (1No.) • Manually operated
(b)	Plumbing lines	<ul style="list-style-type: none"> • Made of SS304L material
(c)	Pirani gauge	<ul style="list-style-type: none"> • 1 Pirani sensor • A measuring range from <u>1000 mbar to 10⁻³ mbar</u> with display of pressure
6	Digital Thickness Monitor (2 No.s)	<ul style="list-style-type: none"> • Rate Display : 3 Digit LED Auto Ranging from 0.00 to 999 Ant/sec • Thickness Display : 4 digit LED display • Crystal Frequency : 6MHz • Film Density: 0.800 to 99.99 gm/cubic sec

7	Load lock	<ul style="list-style-type: none"> • Cylindrical shaped • 50mm (Inner Ø) x 250mm (L) • Opened on one end (standard KF 50 port mouth) and on other end attached to a movable rod (substrate pull rod through vacuum seal). Movement should be leak-free and should withstand high vacuum. Rod diameter: 8mm. Length:750mm • Must have a 100mm cylindrical extension for the load lock (with 10mm Inner Ø) having two vacuum seals on both ends which provides additional support for rod. • The substrate pull rod must have an extension having square cross section (4mm) and length 8mm with a 2mm screw hole on it. This portion is always inside the load lock and is for connecting to the substrate holder.
8	Intermediate chamber (Adapter)	<ul style="list-style-type: none"> • Made out of non-magnetic SS grade, AISI-304L • Cylindrical shaped with length 30mm. • One end having inner Ø 120mm and outer Ø 150mm; other end having diameters same as the load lock (inner Ø 50mm, standard KF 50 port mouth). • Both ends must have rubber O-rings for vacuum tight connection (standard KF 50 on one end). • Provide suitable vacuum locks to seal and connect this chamber to glove box (contact for details). • Standard KF 50 port sealing mechanism between this chamber and the load lock.
9	Substrate heater	<ul style="list-style-type: none"> • 125mm (L) X 105mm (W) X 30mm (H) rectangular heater attached to the centre of top plate using four pillars (copper contact area) • Bottom of heater has one metallic rail made up of slightly flexible metal through which substrate holder and mask assembly slides. • The bottom rail has a funnel type extension having 50mmX50mm square mouth towards the side port for easy sliding of substrate holder (this must be exactly aligned to the side port). • The other end of heater has a buried magnet on bottom side which ensures good contact with substrate holder • Temperature: up to 200°C
10	Knudsen cell type heater	<ul style="list-style-type: none"> • One Knudsen cell type heater system which can give a maximum of 80 to 400°C with Digital PID controller & Thyristor Drive

Important Notes:

1. Please provide complete design and drawing of the system. We may reject the tender if a proper drawing is not provided OR if the outlay/design proposed is not found satisfactory.
2. TMP with pumping speeds more than 680 l/s with controller, 1 Pirani gauge, 1 cold cathode gauge, 1 backing pump will be provided by the institute to complete the setup.



3. Please provide at least 3 references of laboratories (in India) where you have installed similar systems with full specification of the systems. We may reject the tender if we find the reference systems unsatisfactory.
4. Please provide details of after sales service. The supplier should have service centre or facility with complete infrastructure in India to handle major repair of the system. Critical spares should be available off the shelf in Indian offices. In case of a break down, maintenance and replacement of parts should be possible at purchaser's site. We may reject the quote if the after sales service details or feedback from previous purchasers are found unsatisfactory.
5. Please provide a clear warranty statement.
6. Please provide separate technical and financial bids in sealed envelopes.
7. Please mark tender number on top of the cover envelope.

