CORRIGENDUM

Date : 7.5.2014

This corrigendum is in continuation to this office advertisement No. OPEN/GLOBAL TENDER NOTICE NO. CEERI/PUR/2014-15/1 dated 11.4.2014 and Tender No. 03/GAP-3309/MWT/10-Pur/2014/T-149 for the purchase of Reactive Sputtering System. The specifications mentioned in tender are changed, the Vacuum Chamber now requires three 40 mm x 350 mm line source type Magnetron Cathodes and in the substrate holder CSIR-CEERI need multiple substrate holder mechanism to hold Six quartz substrates of dia 5mm to 25mm max. and 20 cm height. The revised specifications of Reactive Sputtering System are also enclosed herewith. The other specifications and Terms and Conditions are the same. Please submit your quotation before due date and time.

Stores & Purchase Officer

Annexure-I

Reactive Sputtering System (Suitable for thin film coatings of metals and oxides on different metals, dielectric sheets, cylindrical and circular DBD Tubes, etc.)	
Parameter	**Specifications**
Reactive Sputtering System	• Reactive sputtering system with capabilities for reactive deposition/co-sputtering of thin layers of several materials (Magnetic and Non-magnetic) and also different Oxides. Intermetallic Alloys to handle Silicon, Quart, Pyrex, Aluminum, etc. • Suitable for coating on cylindrical and circular DBD tubes up to 20 cm height. Multiple substrate holder mechanism to hold quartz tubes of such heights. Each substrate should have rotation up to 0-20 rpm along with planetary motion in substrate holder. • System should support RF and pulse DC sputtering modes. • Uniformity of deposition should be better than ±5% over entire substrate area and same for run to run. • User friendly MIMIC for safe and easy operation. • Estimated thickness of deposited film should be from 10 Angstrom to 1 micron size.
Vacuum Chamber	• A cylindrical Stainless Steel (SS 304L) chamber approximate size 400 mm X 450 mm height suitable to accommodate three 40 mm X 350 mm line source type Magnetron Cathodes. Chamber should be electro-polished from inside and from outside. The chamber should be leak tested for Helium leak rate less than 1 x 10 $^{-9}$ std cc/sec. • Chamber should be fitted with various ports for Turbo Molecular Pump, Vacuum Gauges, view ports, spare ports for future accessories. • Necessary shields should be provided to prevent coating on side walls • Chamber Mounting Structure: Suitable powder coated MS square Channel frame for mounting the chamber.
Vacuum System for Process Chamber	• Turbo Molecular Pump: An imported Turbo Molecular pump (TMP) standard make (Pfeiffer/Leybolds/Edwards make, etc.).of minimum pumping capacity of ~350 lit/sec to achieve ultimate vacuum base pressure of 10^{-6} mbar in less than an hour. It should be provided with controller and connecting cables. • Rotary Vane Pump: A suitable double stage rotary vane pump for backing the TMP.
Vacuum Valves	• High vacuum valves: Bellow sealed, 100 CF-F compatible high vacuum stainless steel gate valves should be provided. • Vent valve bellow sealed, CF 16 compatible and electro-pneumatically operated
Vacuum Gauges	• One standard vacuum measuring Pirani gauge (range: 5 x 10^{-4} – 1000 mbar) for fore-line pressure, one capacitance manometer for measuring process pressure and one cold cathode (inverted magnetron type, range 1x10^{-10} – 0.01 mbar) with display and controller should be provided for process chamber. All the gauges should be standard make (Pfeiffer/Inficon/Leybolds/Matheson/ MKS make, etc.).
Substrate Holder	• Multiple substrate holder mechanism to hold six quartz substrates of dia 5 mm to 25 mm max and 20 cm height. Each substrate should have rotation up to 0-20 rpm. Substrate holder should also have planetary motion. • The substrate heating up to 400^0 C. The temperature should be measured by a 'K' type thermocouple and a PID type temperature controller should control the heating. The variable voltage should be supplied by a Thyristorized Power

	supply. Proper cooling arrangement for protection of O-rings and system.
Magnetron Cathodes	a) ***Line Source Target of 40 mm X 350 mm:*** (Quantity three) o 40 mm x 350 mm. Magnetron Cathodes compatible for DC, RF and Pulse DC Sputtering o Water Cooled o Uniformity < 1.5 % o Target Utilization better than 45 % b) ***350 mm rotatable water cooled cylindrical magnetron cathode*** (Quantity One)***:*** for uniform coating inside the cylindrical substrate of 100 ~ 120 mm inner diameter
RF Generator and Matching Network	• ***1000 Watt RF generator (imported) should be supplied with following specifications.*** o Power: 1000 W ***OPTIONAL*** • ***600 Watt RF generator (imported)*** o Power: 600 W ***Other parameters:*** o Frequency: 13.56 MHz +/- 0.05% o Input: 220 Vac +/- 10%, 50-60 Hz o Control System: Power adjustable from 0 to 100 % of maximum output range o Operating Modes, such as, REAL-TIME – all settings can be changed during operation. LOCAL – settings can be changed only when the system is switched off. REMOTE - external control via A/D interface. Remote Analog/Digital Programming. • **Matching Network** An Auto-manual Matching Network, appropriate for the above RF Generator should be supplied, with following considerations. o Automatic/Manual Impendence Matching Network Unit o Control: Automatic tuning to output independence (static load)
Bipolar Pulsed DC Generator	• ***1 KW Assymetric Bipolar Pulsed DC Generator*** (Qty One) should be supplied with the following specifications; o Frequency: 10 to 125 kHz Variable with option for Pure DC mode o Duty Cycle: 10 to 80 % (for negative cycle) o Power Output: 1 kW o Power & Current limits: Pulsed Voltage +100 to –800 V o Current: 2.0 A @ -800 V o Arc Control: Detects Arc within 500 ns Power ON (Negative cycle) delay after arc detect 20 msec to 50 msec o Regulation Mode: Voltage, Current, Power o DC Linearity Accuracy: +/- 0.1 % of 10-100 % of rated output o Line Regulation : 0.1 % of 800 V o Load Regulation: 0.5 % of Full Power o Line Voltage & Current: 230 V (+/- 10 %) / 9 A o Line Frequency : 50 Hz +/- 2 % o Front Panel: LCD Display which consists of Voltage (+ & -), Current (+ & -), Watts (+ & -), Frequency, Duty Cycle (in nsec), Arc Counter (Reset to zero after ON), Setting of V, I, P, Frequency and Duty Cycle through Keyboard, Local or Remote Toggle Switch, LED Display : Incoming Power ON, Pulsed Output ON, Short Circuit,

	Over voltage, Over Current, Arc Detection Arc Current Detection Limit, Plasma Shutdown time after arc Detection, Standard Connectors, Remote indication of voltage, current, frequency, etc. o Cooling: Forced Air
Mass flow controller for Gas Handling	• Mass flow controller (MFC): one for Argon (0-100 std ccm), one for Nitrogen (0-100 std ccm), and another for Oxygen (0-100 std ccm) provided with digital display and controller. MFC would be standard make (Leybolds/Matheson/ MKS make, etc.) and have standard Swagelok/VCR end fitting. The associated gas line should be tested for Helium leak rate less than 1 x 10^{-9} mbar l/s.

Optional	
Digital Thickness Monitor	Digital Thickness Monitor with accessories for the measurement of thickness of the coating

Notes:

- **Installation and training**
  Installation and commissioning of the above system should be done at CSIR-CEERI, Pilani. The pre-inspection and training of CSIR-CEERI persons for two-five days of the above unit would be carried out at the firm site before dispatch.

- **After sale service support**
  The supplier should have Service Center/Facility and complete infrastructure within India to handle onsite service for the offered majority of the items. Spare parts should be available for sale for atleast 10 years from the date of purchase of the system.

- **To be provided**:
  1. **Spare Parts**
     (a) All power cables and related accessories ,
     (b) All O'rings / gaskets and seals (at least one set)
     (c) Fuses and switches (at least one set)
     (d) Tool kit in accodance with system

  2. **Warranty**
     The equipment will be supplied with onsite warranty for 1 year after dispatch against any manufacturing defects.

  3. **Documentation**
     One complete set of the following documents will be provided
     (a) Operator's Manual
     (b) Maintenance and safety instructions
     (c) Recommended recurring spare parts list
     (d) Mechanical and Electrical drawings, Part Lists, Air, Water and Electrical diagrams.
     (e) Service Manual