Tender Notification for the Procurement of a two-box Argon Glove Box System (Last Date for Submission: 14th Dec 2016)

Kindly send your best quotation for a two-box argon glove box system with the following technical specifications on C.I.P. Bangalore basis. Your quotation should clearly indicate the terms of delivery, delivery schedule, E.D., and payment terms. The tender should be submitted in two separate sealed envelopes - one containing the technical bid and the other containing the commercial bid, both of which should reach us, duly signed on or before 1700 hours on 14th December 2016.

The bids should be addressed to:

The Chairman,
Solid State and Structural Chemistry Unit
Indian Institute of Science (IISc)
Bengaluru, India - 560012.

The sealed bids should be sent to:

Naga Phani Aetukuri
Assistant Professor,
Solid State and Structural Chemistry Unit
Indian Institute of Science (IISc)
Bengaluru, India - 560012.
Ph: +91-80-2293-3534
email:phani@sscu.iisc.ernet.in

Please enclose a compliance statement along with the technical bid.

Technical Specifications for Argon Glove Boxes

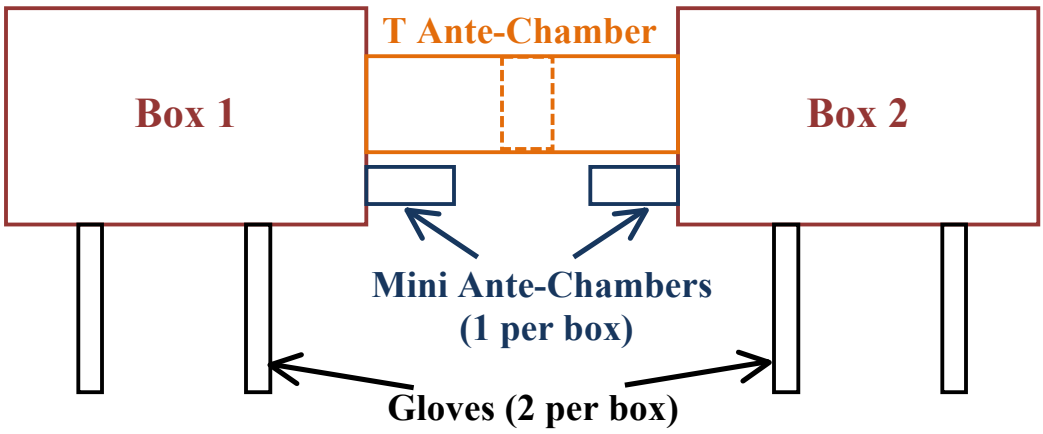

Figure 1. A schematic (not to scale) top-view of the glove box system being specified in this tender request.

1. System Arrangement

1.1 There should be two glove boxes, which can be interconnected via a T-shaped Ante Chamber (see Figure 1). The specifications for each of the boxes is as given below.

Both Box 1 and Box 2 should independently meet the following specifications unless mentioned otherwise.

2. Dimensions

2.1 The working space of each glove box should be at least 900 mm in height, 1250 mm in length and 775 mm in depth

3. Programmatic Logic Control

3.1 Each box should be controllable with independent and fully integrated programmatic logic control (PLC), with a touch panel interface.

3.2 The touch panel interface should serve as a central control unit for all glove box functions and procedures

3.3 All glove box functions should be accessible via the touch panel.

3.4 The PLC should also enable plotting graphical trends of box pressure, oxygen and moisture levels over at least 24 hours.

3.5 It should be feasible to remote monitor box parameters. The PLC should preferably have the ability to send notifications and alerts regarding maintenance schedule and box malfunctioning.

3.6 Graphical display of the box pressure, O2 and moisture levels should be available, preferably in color, in the touch panel interface.

4. T-shaped ante-chamber connecting the two boxes

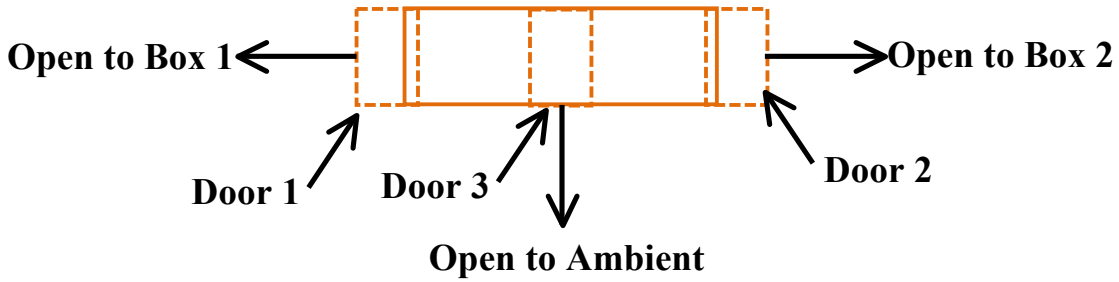

Figure 2. A schematic (not to scale) top-view of the T Ante-Chamber that connects the two glove boxes.

4.1 The T-shaped ante-chamber that connects the two glove boxes should have three vacuum doors, which can seal the ante-chamber for evacuation.

4.2 The ante-chamber should be cylindrical with a diameter of at least 390 mm and a length of at least 800 mm.

4.3 The doors should preferably be with a swing-type opening mechanism to conserve working space.

4.4 There should also be a tray preferably mounted on telescopic rails, which can be slid back-forth and facilitates transfer for tools and chemicals from one glove box to the other.

4.5 The purge and pump out of the ante-chamber should be programmable and be activated via a software controlled touch panel or computer. It should also allow the user to choose between manual control or programmatic control.

5. Purifier

5.1 Each glove box should have an independent and at least one purifier capable of purifying the glove box ambient to attain a purity of <1 ppm H_2O and O_2.

5.2 The removable capacity should be a minimum of 35 liters for oxygen and at least 1300 grams for moisture.

5.3 The purifier should be fully regenerable with an automatic/programmed control.

5.4 The purification system of the glove box should be fully integrated with the heat exchanger and a gas circulation blower.

5.5 The gas circulation blower should be capable of a circulation rate of at least 80 m^3/hour.

5.6 The blower speed should be dynamically controlled via program logic based on the moisture and oxygen content in the glove box so as to make the blower operation power efficient.

6. Solvent Absorption Unit

6.1 Each box should have an independent, fully regenerable solvent absorption unit.

6.2 The solvent trap should be capable of absorbing volatile organic solvents.

6.3 Solvent absorption unit should be fully re-generable via PLC with a regeneration option provided in the touch panel controls.

6.4 The Solvent absorption unit should have both inline and bypass modes (See Figure 3).

6.5 There should be the option of attaching a solvent sensor, which is capable of indicating when to regenerate the solvent adsorption unit

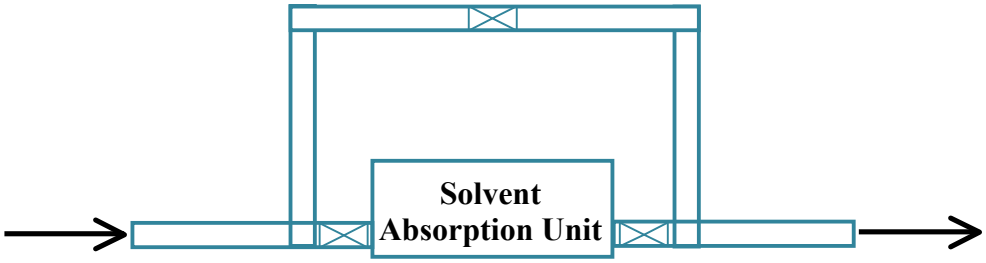

Figure 3. A schematic (not to scale) side-view of the circulation lines for the solvent absorption unit that shows the absorption unit by-pass and inline connections.

7. Box pressure

7.1 Box pressure should be controllable automatically (via programmatic logic) within a pressure range of -15 to 15 mbar.

7.2 The desired pressure should be settable via the touch panel interface.

8. Gloves and Glove Port Covers

8.1 There should be at least two polymer (polypropylene is preferred) glove ports for each box and butyl gloves should be provided for these glove ports.

8.2 The size of each glove port should be at least 200 mm.

8.3 The glove ports should be O-ring sealed against the gloves.

8.4 At least one additional pair of butyl gloves should be supplied with each box.

8.5 Each box should be supplied with at least one glove port cover.

8.6 The thickness of the butyl gloves should be a minimum of 0.4 mm

9. Mini Ante-Chambers

9.1 Each box should have at least one mini Ante-chamber for sample transfer.

9.2 The ante-chamber should be at least 150 mm in diameter and 300 mm in length.

9.3 The ante-chamber should have a sliding tray to enable sample transfer.

9.4 There should be a 3-way valve to enable evacuation and venting of the ante-chamber.
9.5 The ante-chamber should have a door, preferably a hinged door, that can seal the ante-chamber for evacuation.

9.6 There should be the possibility of having a heated mini ante-chamber which can heat the chamber to at least 120 degrees centigrade. The temperature should be controllable via programmable PID control.

10. Box Construction

10.1 Both the boxes should have bolted side panels that will enable the boxes to be modular and expandable or enable connection to other similar boxes in the future.

10.2 The front panel of each box should be made of polycarbonate.

10.3 Inners of the glove boxes, and all ante-chambers should be 304 grade or 316 grade or similar corrosion/chemical resistant grades of brushed stainless steel.

10.4 The trays, rails and other components in the ante-chambers should also be of 304 grade or 316 grade or similar corrosion/chemical resistant grades of brushed stainless steel.

10.5 The external should either be coated with a chemical/abrasion resistant coating or be the brushed stainless steel of the same or better quality as the inners.

10.6 At least two dust filters (HEPA or ULPA filters) should be provided in each box – one for filtering inlet Argon and one for filtering the box ambient before it goes out to the gas circulation system.

10.7 Filters should be provided with the glove box. An additional pair of filters for each box should preferably be supplied with the equipment.

10.8 The box should have at least ***5*** DN 40 feed-through, wherein at least two are electrical feed-throughs.

10.9 An illumination source that lights up the working space, preferably a fluorescent lamp, should be provided. The light should have a switch (a hardware or a control in the touch panel) to turn on/off.

10.10 The circulation system should make it possible to have positive pressure regulation without vacuum pump and should be fully integrated with the heat exchanger.

10.11 A foot pedal for controlling box pressure should be provided.

10.12 A retort stand should be provided with each glove box.

10.13 At least **two** height-adjustable stainless steel shelves of at least 900 mm in length and at least 200 mm in depth should be provided

11. Vacuum Pumps

11.1 Each box should come with a Rotary vane pump (at least 15 m^3/hour capacity) with Oil mist filter and Oil re-circulation.

11.2 There should be automatic gas ballast control

11.3 The pump ON/OFF should be controllable via the touch panel.

11.4 The option of upgrading to an oil-less scroll pump should be available.

12. Sensors

12.1 A solid-state oxygen sensor capable of measuring oxygen levels from 0-500 ppm should be provided.

12.2 A solid-state moisture sensor capable of measuring moisture levels from 0-500 ppm should be provided.

12.3 There should be the option of attaching a solvent sensor to trigger an alarm when the solvent absorption unit is full

13. Box Purging

13.1 Automatic Box purge should be possible via PLC.

13.2 PLC should trigger an automatic box purge either due to high O_2 or moisture in the glove box or an automatic timer option to trigger box purge at a preset time for a preset duration.

13.3 A maximum argon flow rate of 200 liter/min during purging should be possible.

13.4 The O_2 and moisture trigger set-point range should be between 10-999 ppm.

14. Other requirements and options

14.1 There should be at least **4** single-sided DN200 ISO-F flanges (one side welded onto the glove box side panels) with blanks, on each of the glove box side panels (on the side panels that do not attach to the T ante-chamber).

Figure 4. A schematic (not to scale) front and side-view of Box 2 showing the DN200 ISO-F flange positions on the side panel.

14.2 Oil bubblers should *NOT* be used in any of the gas circulation lines.

14.3 NO component in the gas circulation line (except for the vacuum pumps) should use oil or oil containing parts.

14.4 There should be the option to add a recirculation chiller to have a stable globe box ambient temperature.

14.5 The optional chillers should be able to regulate the temperature between 5 and 30 degrees centigrade.

14.6 The chillers should preferably have a cooling capacity of 1000 W at or near room temperature (25 degrees Centigrade)

14.7 The vendor is responsible for the installation of the system at the institute.

14.8 A minimum of 1 year warranty and at least one additional year of annual maintence contract is required.

15. Terms and conditions

15.1 The vendor should have a track record of having previously supplied at least five glove boxes with the above or similar specifications in India (please furnish the details).

15.2 The vendor should have qualified technical service personnel for the equipment based in India (preferably in Bangalore).

15.3 The lead time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order.

15.4 The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason is reserved.

Yours truly,

Naga Phani Aetukuri
Assistant Professor,
Solid State and Structural Chemistry
Indian Institute of Science (IISc)
Bengaluru, India.
Ph: +91-80-2293-3534
email:phani@sscu.iisc.ernet.in