Bhabha Atomic Research Centre Applied Physics Division

Tender No. BARC/APD/EHPPL/MF/PK/2022/02 Due of

Due on: 8th March 2022 at 1600 hrs

Sub: Invitation of Quotations for <u>Design, Fabrication, testing, supply installation and</u> <u>commissioning of mixer vessel, double tube type condenser, storage vessel and</u> <u>filter as specified in annexure-I, II.</u>

Dear Sir,

- 1) Quotations are invited for the <u>Design, Fabrication, testing, supply installation and</u> <u>commissioning of mixer vessel, double tube type condenser, storage vessel</u> <u>and filter as specified in annexure-I, II.</u>
- 2) Bidder shall quote for the same.
- 3) Taxes shall be quoted separately.
- 4) Quotation must be in the printed letter head/quotation format, which should consist of PAN number of the firm, registration number, GST no. etc. Quotation shall be in two-Parts, one is technical and other is commercial bid. These two quotations shall be in separate envelope Supper scribed "technical bid" and "Commercial Bid".
- 5) The quotations must strictly reach through <u>Indian Post only</u>, Head, Applied Physics Division Purnima Laboratory Bhabha Atomic Research Centre, Trombay, Mumbai 400085.

Attn: Shri. Praveen Kumar On or before 08/03/2022 at 1600 hrs. and must be sent in a sealed envelope super scribed "MINOR FABRICATION" with the above reference number and due date given above.

- 6) The fabrication work shall be subject to inspection by our engineer.
- The bidder shall specify the work completion period (not exceeding 6 months), in case of order.
- 8) Head, Applied Physics Division, B.A.R.C, reserves the right to accept/reject any or all quotations without assigning any reason.
- 9) Payment: Payment will be made by ECS only after satisfactory completion of work on production of bill, delivery challan and advance stamped receipt. It may be noted that IT @ 2% or as applicable shall be deducted from your bills.
- 10) Validity: The offer shall be kept open for acceptance for a period of 90 days from the date of opening of quotation
- 11) **Delivery**: Supply of finished job to the user site shall be in the scope of Supplier. (Facility is located at EHPPL, BARC, Chinchvali village, Malang Road, Kalyan).

Enclosure: Annexure-I, II.

(Praveen Kumar)

Scientific Assistant - D

# Specification for the design, Fabrication, testing, supply, installation and commissioning of mixer vessel, double tube type condenser, storage vessel and filter.

This specification shall be governing factor for the design, fabrication, testing, supply, installation and commissioning of the mixer vessel, double tube type condenser, storage vessel and filter. In case of any query supplier can contact on email: <a href="mailto:pksen@barc.gov.in">pksen@barc.gov.in</a>, call on: 022-25591808.

**1. Scope of Supply:-** The complete work involved under the scope of contract shall be as follow:

- i. Submission of list of items along with detail specification to user
- **ii.** Submission of detail drawing of all fabrication components to user for approval.
- **iii.** Submission of complete assembly drawing to user for approval.
- iv. Submission of Quality Assurance Plan for complete assembly.
- v. Procurement, material testing, manufacturing and testing of components at supplier site.
- vi. Submission of material test report and calibration report to user.
- vii. Packaging and delivery of complete unit at purchaser's site.
- **viii.** Installation and commissioning of system at purchaser's site.

In case of any minor changes during the fabrication, installation and commissioning shall be under the scope of supply.

## 2. General guidelines:-

- i. All the flange and fitting shall be used as per ANSI 150.
- **ii.** After welding, the entire weld surface shall be ground flushed to prevent any crack and crevices.
- **iii.** Supplier shall perform Dye-Penetration test on weld joints and hydraulic test of individual vessel as well as complete unit in presence of user representative.
- iv. Vessels inside finish shall be of mirror finish type.
- **v.** Suitable insulation shall be provided to the heating lines/components to keep the exposed surface temperature below 47 °C as per IS-7413.

# 3. Specification for the mixer vessel:-

## Qty.:- 01 set

- i. Vessel volume and dimension: 25 liter, dia. 315 mm, Length 377 mm, thickness 6 mm.
- ii. Vessel operating parameters:-
- iii. Operating temp& pressure: 30-90 °C.
- iv. Motor RPM range: 0-800.
- v. Process fluid: Water and acetone.
- vi. Material of construction: SS 304 L.
- **vii.** A SS body pressure gauge with suitable valve shall be provided at the top of the vessel.
- **viii.** Top and bottom of the vessel shall be separable with flange fitting. Eye bolt with wing nut may be used to tight flange.
- **ix.** Vessel shall be jacketed type to heat the process material with 5 psig steam. Steam jacket along with baffles shall be provided.
- **x.** Steam jacked shall be properly insulated with suitable insulation so as to maintain surface temp below 30 °C.Insulating materiel shall be clade with SS.
- **xi.** Connection at the Top: water inlet, acetone inlet, funnel type chute with sealing cover, vapor outlet, thermowell in vapor outlet line, pressure gauge, one additional port.
- **xii.** Funnel type chute shall be provided with O-rings and complete leak tight.

- **xiii.** 0.5 HP flame proof motor with VFD is available at user site. This motor shall drive agitator in the mixing vessel and currently accommodating shaft of dia 16 mm. A turbine agitator along with shaft shall be provided by supplier to fit with existing motor.
- **xiv.** Bottom connection: 50 inch pipe with plug valve/butterfly valve.
- xv. On-OFF controller with solenoid valve designed for 50 psig &150 C, shall be installed in steam line to cut-off steam when temp reach at set point.
- **xvi.** 15 NB inlet and outlet connection with TD trap shall be provided to steam jacket.
- **xvii.** Thermocouples along with display unit shall be provided to measure vapor and liquid temp.
- **xviii.** Vessel shall be design for 1.5 bar pressure and hydraulically tested at 2 bar for no leakage. All the weld joints shall be test with dye penetration test.
- xix. A peristaltic pump with variable flow rate from 100 -1500 ml/min shall be provided. Pump shall have function Bi direction movement, LCD display and shall be designed for continuous operation of 8 hours. MOC of pump enclosure, rotor, and roller shall be SS304.
- **xx.** A mass flow meter (range 5-10 LPM) shall be installed in water fed line.

## 4. Specification for Double tube type condenser:- Qty.: 01 Set

- i. Heat load on condenser: 2.2 kW.
- **ii.** Material of construction: SS304 L.
- iii. Heat ex-changer shall be designed as per IS4503, However ASME section VIII, Division -1 or TEMA guidelines may be incorporated wherever require during design, fabrication and testing.
- iv. Coolant flow rate: 15 Kg/hr at 343 K and 3.5 bar.
- v. Vapor flow rate: 15 Kg/hr at 343 K and 1 bar.
- vi. RTD/ thermocouple along with display unit shall be provided to measure vapor In and condensate temp.
- vii. Inside tube design pressure and temp.: 4.5 bar & 100 °C.
- viii. Outside tube design temp. & pressure: 4. 5 bar & 50 °C.
- ix. Total condenser length shall be 1.5 meter. Inner tube shall be 20 NB and outer tube shall be of 40 NB.
- **x.** 15 NB water inlet and outlet connection shall be provided to outer pipe.
- xi. Longitudinal or circular fins may be incorporated at inner tube for efficient heat transfer.

#### 5. Specification for Storage vessel:-

- i. Material of construction: SS304 L
- **ii.** Volumetric capacity: min. 25 L.
- iii. Dimensions: dia. 315 mm Length 377 mm thickness 6 mm.
- iv. Top connections: 20 NB pipe along with ball valve, pressure gauge with isolation valve, ¼ inch needle valve for air vent.
- **v.** Bottom connection: as per inlet size of peristaltic pump.
- vi. Vessel shall be designed for 1.5 bar.
- vii. Flange end of the shall be provide with O-ring compatible with Acetone.

#### 6. Specification for filter:

- **i.** A bucket type filter shall be provided below the mixer vessel.
- **ii.** Bucket material of construction: SS 304 L.
- iii. Volumetric capacity: 2 liter

Qty.: 02 sets

Qty.: 02 sets

- iv. Filter rating: 5 micron
- **v.** Filter shall be designed and fitted for easy assembly and cleaning.

## 7. Specification for support frame structure.

## Qty.: 01 Set

- **i.** This complete system shall be mounted on a table top. Where mixer vessel along with agitator motor, condenser, storage vessel -1 shall be on the top of the vessel and peristaltic pump, storage vessel -2, motor controls, temp display, flow display shall be mounted beside/under the table.
- **ii.** Control panel box shall be powder coated and entry and exit of the cables shall be packed by proper gland packing.
- **iii.** Support frame structure shall be made of SS and all the perimeter display unit shall be installed in the sealed box mounted under the table.
- **iv.** Earthing connection shall be provided to vessels along with complete assembly.

## 8. Documentation:

- i. Material test certificate of all components.
- **ii.** Calibration certificate for temperature sensor, pressure gauge and flow meter.
- **iii.** Supplier shall produce all documents at the time of inspection of item.
- **iv.** 2 sets of design calculation and drawing of the part and complete system along with soft copy of the same.

## 9. Warranty:

Supplier shall provide one year warranty certificate for all the components. In case of any component failure, supplier shall repair/ replace the component within one month of the event reported. If the holdup time for the failure part is more than one month, the warranty period may further extended.

## 10. Delivery:

This complete unit shall be subjected to inspection before delivery at user site. Supplier shall make arrangement of inspection and testing of items at their site. All the components shall be properly packed to avoid damage during shipment. The equipment shall be delivered **within four months** after receiving of Purchase order.

