



# Indian Institute of Technology Kanpur

## National Center for Flexible Electronics

Enquiry number: SCDT/FLEXE/2018-2019/01

Tender Opening Date: 18/04/2018

Tender Closing Date: 08/05/2018

Closing Date Extended: 17/05/2018

Sealed Quotations (Technical & Commercial) are invited for the supply and installation of the **stainless steel chemical reactor**. The technical specification of vessel is as.

Note: Bidders may deposit their Bids (both Technical Bid and Price Bid, in two separate sealed envelopes, marking envelope as Technical Bid and Price Bid respectively and then put these two envelopes in one big envelope marked with the tender number and closing date) in the tender box.

### TECHNICAL SPECIFICATION FOR THE STAINLESS STEEL CHEMICAL REACTOR.

- Vessel is made up of stainless steel with gross Volume of 12 ltrs and minimum workable volume would be 2 ltrs.
- Vessel should be mounted vertically on the powder coated stand
- Design Code cGMP/ASME Sec VIII Div. IED 2010 & BPE 2012: Guidelines.
- Reactor vessel must be integrated with Stirrer, In-line homogenizer and circulator for temperature control

Vessel Details:

- a) MOC Contact Parts AISI SS 316L
  - b) MOC Non-Contact Parts AISI SS 316L
  - c) Gasket Food Grade Silicon
  - d) Design Pressure, bar 6 kg / cm<sup>2</sup>
  - e) Non-Contact Parts SS 316L / Cladded
  - f) Gasket Silicon Design Temperature °C Shell 100°C & Jacket 150°C
  - g) Hydro Test Pressure, Shell 6 kg / cm<sup>2</sup> & Jacket 6 kg / cm<sup>2</sup>
  - h) Area Considered Safe Area
  - i) Surface Finish: Internal Surface finish  $\leq 0.4$  RA & External Surface finish  $\leq 0.8$  RA
  - j) Jacketed or Plain or Limpeted: Jacketed
  - k) Main Shell Thickness: 5mm
  - l) Top type: 10% Std Torispherical
  - m) Bottom Type 10% Std.Torispherical
  - n) Top & Bottom Thickness: 5mm
  - o) Jacket Thickness : 5mm
  - p) Insulation: 25 thik. RBFQ Insulation with SS Welded Cladding on shell only
  - q) Support: Legs
- Wetted Mirror finished 304 grade S.S. Outer Body: Made of 18 SWG CRC sheet duly powder coated.

Mechanical Stirrer

- a) Stirrer Type: 0.5 H.P, 1400 RPM with V.F.D. control
- b) Mounting :Top
- c) RPM: 1400 R.P.M.
- d) Motor 0.5 H.P.

- e) Impeller Type: Propeller
- f) Nozzle Schedule: Top Nozzle :
- g) Inlet Port: 25 mm, T/C end with J tube
- h) Safety Valve on Vessel 25 mm, T/C end
- i) Vacuum nozzle with blank 25 mm, T/C end
- j) Hand Hole 100 mm Light / sight Glass 50 mm
- k) N2 Inlet: For Nitrogen Purging 19 mm, T/C end with ball valve
- l) Spare 19 mm, T/C end  $\Delta$
- m) Temp Sensor Sensor with NA Connector
- n) Side Nozzles for Jacket
- o) Heating/Cooling Water Inlet/Condensate water Outlet 25 mm, T/C end
- p) Heating Cooling Water outlet/Steam Inlet 25 mm, T/C end
- q) Vent ¼ BSP.
- r) Bottom Nozzle: Vessel Outlet 25 mm Manual zero dead leg flush bottom valve

Inline Homogenizer (capacity)

Reactor should have attached with the inline homogenizer for continuous circulation of the material. The technical specifications of the in line homogenizer is as follows

Technical Specification:

Material of construction: - S.S.316L All contact parts.

Working Principle: - Stator / Rotor.

Stator: - To suit rotor dia with straight opening.

Rotor: - 4 Blades flower type.

Inlet: - 1"  $\emptyset$ .

Outlet: - 3/4  $\emptyset$ .

Motor: - 2 H.P., 2880 R.P.M., STD Motor.

Mech. Seal: - Double acting back to back cartridge type Tc Vs Tc.

Bushings: - Glass Teflon / Ph. Bronze.

ELECTRIC CONTROL PANEL: Electric control panel provided with following facilities.

1. R. Y.B. Indication lamp.
2. Temp Controller.
3. Stirrer On / Off.
4. RPM Indicator.

All the above unit mounted on SS 316L mat. Trolley with castor wheels at the bottom for easy movement.

Circulator Bath: The purpose of this bath to maintain the temperature of the reactor

- Temp. Range : -10°C to 200°C
- Temp. Accuracy:  $\pm 1^\circ\text{C}$
- Temp. Stability:  $\pm 1^\circ\text{C}$
- Temp. Control: Microprocessor Based PID.
- Display: LED
- Bath Capacity: 5 to 8 L
- Heater Capacity: 1500 W
- Refrigerants: R134 A
- Pump Capacity (Flow Rate): 10 to 15L / min.
- Temperature Sensor: PT 100
- Safety feature: (a) Adjustable High temperature cut off device.(b) Dry Running protection.
- Cooling System: Hermitically sealed compressor CFC free,
- ECO friendly system, air cooled condenser.
- Drain Tap: At back side or in front as per required. Two Nozzle: Made up of S.S. for inlet & outlet.

## General Terms & Condition

1. Evaluation will be done on the basis of technical specifications given in tender document.
2. Financial bid will be open for those only who qualify all the technical specification as per our tender notice.
3. Quotation must be valid for 90 days
4. Please send the name and contact details of the person to whom company had supplied/ or give services for similar systems & requirement. Committee may ask for the feedback.
5. Payments terms: 70% against delivery at IIT Kanpur, 20% against installation and 10% against successful running of equipment 3 months and approval.
6. The supplier must have supplied systems to institutions of national and/or international repute.
7. Warranty/Guarantee should be clearly mentioned. The Warranty must start from the date of installation at IITK.
8. Installation, demonstration, and training-sessions at IIT Kanpur will have to be provided by the manufacturer or the vendor for the quoted system free of cost.
9. Quotation should carry proper certifications like proprietary certificate/ authorization certificate from manufacturer, etc.
10. Price must include all taxes and charges.
11. Institute is exempted for partial custom duty (CD applicable to IIT Kanpur is 5.15%).
12. The delivery period should be specifically stated. Earlier delivery may be preferred.
13. At any time prior to the deadline for submission of bid, the Institute may, for any reason, at its own initiative, modify the bid document by amendments. Such amendments shall be uploaded on the website through corrigendum and shall form an integral part of bid document. The relevant clauses of the bid document shall be treated as amended accordingly. It shall be the sole responsibility of the prospective bidders to check the website from time to time for any amendment in the tender document. In case of failure to get the amendments, if any, the Institute shall not be responsible for it.
14. The Penalty @1% per week or part thereof subject to max 10% of the delivery price will be deducted from the balance payment, if supply is not completed within aforesaid delivery period.
15. 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.

Kindly send the quotation in sealed envelope latest by 3:00 PM on Dated 17.05.2018 to the following address.

Dr Ashish

Room No. 305,

Samtel Center for Display Technologies/ National Centre for Flexible Electronics (SCDT/FLEXE),

Indian Institute of Technology

Kanpur – 208 016, U.P.

India

Tel: (91) 0-512–259 7692/6622/6088/6987. Email: [ash@iitk.ac.in](mailto:ash@iitk.ac.in); [vikash@iitk.ac.in](mailto:vikash@iitk.ac.in);