

**INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A & B, RAJA S.C.MULLICK ROAD
JADAVPUR, KOLKATA-700032**

Tender No.: OC/JD/DST-Project/15/02 dated 22.01.2015

Sub: "Flow Reactor"

Sealed tender in two bids system (**Technical Bid & Financial bid**) is invited from bonafide, resourceful and eligible manufacturers/exclusive distributors for **"Flow Reactor"**.

Part - I (Technical Bid) of the tender should contain technical details and commercial terms and conditions and **Part - II (Price Bid)** should indicate group-wise price as mentioned in the Technical Bid where applicable. The Technical Bid and Price bid are to be submitted in two separately sealed envelopes distinctly marked accordingly and both to be put inside another envelope, which should be sealed and super scribed with tender notice no. and due date. The bidders may submit bids duly signed in their own letterheads.

Complete tender bids should reach the **office of the Department of Organic Chemistry, Indian Association for the Cultivation of Science, 2A & 2B Raja S. C. Mullick Road, Jadavpur, Kolkata - 700032** on or before the scheduled date & time specified below.

Tender Notice No.	OC/JD/DST-Project/15/02 dated 22.05.2015
Last date and time of submitting tender	21.07.2015 upto 3.00 P.M.
Pre-bid meeting	15.06.2015 at 3.00 P.M.
Date and time of opening tender	21.07.2015 at 3.00 P.M.
Place of opening tender	IACS Kolkata, Lab 108A
contact	e-mail: ocjd@iacs.res.in Tel. +91-33-2473 4971 (ext. 1405)

The **technical bids** will be opened first to evaluate the technical specifications of the equipment thereafter, the **Price bids** of only technically qualified bidders will be opened.

1. TECHNICAL BID:

The Technical Bid should contain technical specifications and kept in a separate envelope duly super scribed as **"Technical Bid"** on the outer side of the envelope as detailed above.

TECHNICAL SPECIFICATIONS FOR FLOW REACTOR

The requirements for a flow reactor system are:

- Maximum chemical resistance (THF, concentrated acids, bases, oxidants, reductions, organometalics, etc...).
- Smooth and constant flow rates with low pulsations over long period of use.
- No cavitation and pressure variation issues for the widest possible range of solvents from volatile to viscous.
- Flow rate range from 1 $\mu\text{L}/\text{min}$ to 10 000 $\mu\text{L}/\text{min}$ with high accuracy from lower to upper limits.
- Fast (>10 s) system pressurisation without restriction of flow.
- Accurate pressure at all times that remains constant with changes in flow rate.
- Wide range of reactor sizes and formats.
- Multi-phase, homogenous or heterogenous chemistry possibilities.
- Automatic leak detection and blockage management
- Disassembly of the pump channel (for cleaning or part replacement purposes) in less than 5 min without the need for tools.
- Disassembly of the back-pressure regulator (for cleaning or part replacement purposes) in less than 1 min without the need for tools.
- Constant monitoring, recording and storage on a hard-drive of the system pressure.
- Must have all wetted parts glass or fluorinated polymer
- System must be completely modular to allow upgrades to future chemistry requirements
- **System should consists of**
- 1) PUMP: It should be a Syringe pump having Two independent channel to pump two different Fluids, within built pressure sensors Where the fluid is pushed in from as syringe in Continuous non Pulsating Fashion. The pump should have the capability to automatically filling the syringe from a Reservoir.
 - Must be pressure rated to 0- 20 bar (300 psi)
 - Must not be a HPLC, piston or rotary pump solution
 - Must allow pumping of viscous solvents without cavitations and therefore requires a pressurised input
 - Must allow flow rates of 1 μl - 10ml/min each, rated 20 bar with integrated PTFE pressure sensor.

- All wetted parts must be PTFE or Glass.
 - Residence time; 1 second to multi hour
- 2) Pressure controller: To set Back pressure of the system from 1bar to 20bar. Should be Manually Controlled from the Front channel.
- Pressure displayed to 0.1 bar, must be accurate and must use a micro fluidic solution (Ability to integrate complete aqueous work up liquid liquid extraction in Future)
- Modules must be able to be controlled manually from the front panel of the instrument
- 3) Heater with Adaptor: The Heater should provide heating for all types of flow Recators with its range of adaptors that should be interchangeable in Seconds.
- To Provide heating for all types of Flow Recators. The Temperature range should be from Ambient to 250 °C .Capable of Manually controlling the Temp from its front panel.
- 4) Reactors: System will have tube reactors and solid phase reactors and the capability of adding micro reactors in future.
- **Tube Reactors:** 4mL in Stainless Steel
- **Solid Phase Reactors:** 2.4 mL & 5.6 mL max temp 150 °C
- 5) Low Temperature module: up to -70 °C (needs liq nitrogen or dry ice)
- **Future Upgrade ability:-**
- All Modules must also be able to be Operated By PC (using The Asia Automator)
 - Connecting all modules together and controlling reactions from the pump
 - Full PC software Automation of series of experiments using PC,
 - Automated Sample Diluter
 - Cryo cooler up to -100 °C for chip reactor (no external cooling medium needed)
 - In-line liquid-liquid extraction with continuous separation of organic and aqueous streams
 - To carry out Electro Chemical reactions
 - Ability to run Glass /quartz micro reactors in the future
- Ability to integrate 3rd party HPLC/LCMS systems by sampling the reaction mixture and diluting sample and injecting into HPLC system (also starting the HPLC system in an automated manner).

The financial bid indicating (item-wise) price for the item (s) mentioned in the technical bid should be kept in a separate sealed envelope duly super scribed as "**PRICE BID**" on the outer cover of the envelope as already detailed above. The price bids of only technically qualified bidders will be opened and they will be intimated the date and time of opening at their email id-s. Rest of the bids will stand rejected.

PRICE: Price to be quoted both on **FOB/CIF/EX WORKS** basis. Name of the particular Port from where our authorized forwarder will lift the consignment must be mentioned clearly with **FOB/CIF/EX WORKS** price.

3. BID SECURITY:

- i) The financial bid should be super scribed as "PRICE BID" on the outer cover of the envelope.
- ii) **Bid Security (EMD):** An Account Payee Demand Draft of Rs. 40,000/- (Forty thousand only) in the name of "Indian Association for the Cultivation of Science" is to be furnished by the bidders as Bid Security money or Earnest Money Deposit (EMD).
- iii) The Demand Draft for the Bid-Security money should have at least 45 (forty five) days validity period after the opening of the Bids.
- iv) In case of non-award of the work the Bid Security money would be returned to the unsuccessful Bidders.

4. PERFORMANCE SECURITY:

An Account Payee Demand Draft of **10% of the order value** in the name of "Indian Association for the Cultivation of Science" is to be furnished by the successful bidder as Performance security. Performance security money should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. Bid security money will be refunded to successful bidder on receipt of THE Performance security money.

5) GENERAL INSTURCTIONS:

- 1) Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof.
- 2) Tender Notice Number and tender for "Flow REACTOR" should clearly be written on the envelope.
- 3) At any time prior to the bid due date, IACS may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder during pre-bid meeting, modify the bidding documents. The amendment(s) will be notified on the Institute website. Prospective bidders are advised to occasionally visit the website (www.iacs.res.in/tender) for any amendment.

- 4) **Payment:** 100% through Letter of Credit. 90% to be released on shipment and balance 10% against successful installation & commissioning subject to submission of performance guarantee."
- 5) **Warranty:** 1 year and additional 1 year free service.
- 6) **Installation/Demonstration/Application Training at site:** Free of cost by the supplier.
- 7) **Service facility:** Supplier should mention their details of service setup and Manpower in Kolkata who are responsible for after sales support. Response time should be within 24 hours.
- 8) **Validity of tender:** Tender submitted shall remain valid at least for three months from the date of opening the tender. Validity beyond three months from the date of opening of the tender shall be by mutual consent.
- 9) The tender should accompany a compliance chart.
- 10) The rate should be inclusive of all taxes, transportation etc. Nothing extra will be paid in addition to the quoted rate.
- 11) The model number, make, and a printed literature of the product shall submit positively.
- 12) Proposed delivery schedule should be mentioned clearly.
- 13) Manufacturers/exclusive distributors/vendors should have history of supplying this type of instrument to this or other Scientific Organizations.
- 14) Authorized Dealership Certificate is must in case of principal manufacturing company is not quoting directly.
- 15) Guarantee certificate, users manuals etc. are to be handed over to the user after successful commissioning of the system.

- 16) In the event of date being declared a closed holiday for purchaser's office, the due date for submission of bids and opening of technical bids will be the following working day at the appointed time.
- 17) In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
- 18) For any clarification regarding technical specifications, etc. please send your queries to "Dr. Jyotirmoyee Dash" ocjd@iacs.res.in.
- 19) The Institute reserves the right to reject any or all of the tenders received without assigning any reason thereof.

R E G I S T R A R