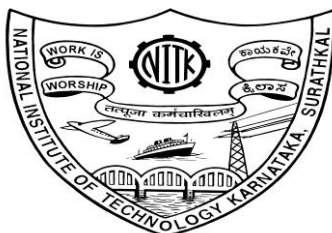


NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

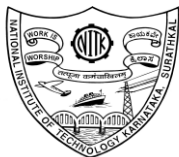
DEPARTMENT OF CHEMICAL ENGINEERING
 POST SRINIVASNAGAR, MANGALORE – 575 025 (D K)
 Phone: (0824) 2474000. Fax: (0824) 2474033
 E- mail: info@nitk.ac.in Website: <http://www.nitk.ac.in>



NOTICE INVITING QUOTATION

Notification. No: **NITK/CH/Computer-controlled Packed Bed /22-23/1580** dated:09-02-2023

| | |
|--|--|
| Name of Goods | Computer-controlled Packed Bed |
| Estimated Amount: | Rs. 2,00,000 /- |
| Time for Supply of item after release of Purchase order | 21(Days) |
| Document Download / Sale Start Date | 18-02-2023 at 6.00 PM |
| Clarification Start Date | Not Applicable |
| Clarification End Date | Not Applicable |
| Bid Submission Start Date | 18-02-2023 at 6.00 PM |
| Last Date for submission of bids | 27-02-2023 before 3.00 PM |
| Bid Opening Date | 27-02-2023 and 3.30 PM |
| Address for Submission of bids | Dr. Jagannathan T. K. Assistant Professor Department of Chemical Engineering NITK Surathkal POST SRINIVASNAGAR, MANGALORE – 575 025 (D K) E-mail: jagantk@nitk.edu.in / Phone: +91-824-247 3642 |



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Notification No NITK/CH/Computer-controlled Packed Bed /22-23/1580 dated:09-02-2023

NOTICE INVITING QUOTATION (NIQ)

The National Institute of Technology Karnataka, Surathkal (in short – NITK, Surathkal) is an Institute Of National Importance Under Ministry of Education Govt of India, imparting Technical Education and engaged in Research Activities. It is proposed to procure the items for the departmental academic/research activities.

Sealed Quotations as per the Price Schedule given in this NIQ are invited for the following items subject to the terms and conditions, from the reputed manufacturers or its authorised dealers so as to reach on or before scheduled date and time. The quotations in the firm's Business letter head should be address to the "Director, NITK, Surathkal". The envelope shall be superscribed with the Quotation Notification Number and the Name of the Goods for which quotation is submitted.

| Name of Goods | Computer-controlled Packed Bed |
|--|---------------------------------------|
| Estimated Amount: | Rs 2,00,000 /- |
| Time for Supply of item after release of Purchase order | 21 (Days) |
| Document Download / Sale Start Date | 18-02-2023 at 6.00 PM |
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| Bid Opening Date | 27-02-2023 and 3.30 PM. |

**Sd/-
HOD**

Note: Institute shall not be responsible for any postal delay about non-receipt /non-delivery of the bids or due to wrong addressee.

SECTION-1
Terms and Conditions

1. The rates should be quoted for preferably FOR destination from supply within India.
2. The bidder shall indicate the excise duty exemption for the goods if applicable.
3. The rate quoted should be on unit basis. Taxes and other charges should be quoted separately, considering exemptions if any. The rate should be quoted in INR only
4. Rate quoted should be inclusive of Testing, commissioning and Installation of equipment and Training.
5. Payment: No advance payment will be made. Payment will be made only after the supply of the item in good and satisfactory condition and receipt of performance security by supplier.
6. Guarantee/Warranty period should be specified for the complete period should be specified in section 3 of this tender document.
7. Period requirement for the supply and installation of item should be specified in section 3 of this tender document.
8. In case of dispute, the matter will be subject to Mangalore Jurisdiction only.

SECTION-2
SCHEDULE OF REQUIREMENTS, SPECIFICATIONS AND ALLIED DETAILS
[To be filled up by the Department / Centre of NITK, Surathkal]

| | |
|---|---|
| Item(s) Name to be Procured | : Computer-controlled Packed Bed |
| Brief Specifications of the Item(s) (Attach Additional Sheet if necessary) | : Attached |
| Quantity | : 1 |
| Any other details / requirement | : Not Applicable |
| Warranty Period required | : 3 years |
| Delivery Schedule expected after placement of Purchase order (in Weeks) | : 3 Weeks |

SECTION 3
PRICE SCHEDULE

[To be used by the bidder for submission of the quotation]

-
- | | | |
|-----|--|---|
| 1. | Item Name | : |
| 2. | Specifications (Conforming to Schedule of requirements Enclose additional sheets if necessary) | : |
| 3. | Currency and Unit Price | : |
| 4. | Quantity | : |
| 5. | Item Cost (Sl No. 3 * Sl. No. 4) | : |
| 6. | Taxes and Other Charges (i) Specify the type of taxes and duties in percentages and also in figures. (ii) Specify Other Charges in figures. | : |
| 7. | Warranty Period (Conforming to the Schedule of requirements) | : |
| 8. | Delivery Schedule (Conforming to the Schedule of requirements) | : |
| 9. | Name and address of the Firm for placing purchase order | : |
| 10. | Name and address of Indian authorized agent (in case of imports only) | : |

Signature of the Bidder: _____

Name and Designation: _____

Business Address : _____

Place:
Date:

Seal of the Bidder's Firm

SECTION 4
CONTRACT FORM

[To be provided by the bidder in the business letter head]

1. (Name of the Supplier's Firm) hereby abide by the delivery schedule mentioned in this document for supply of the items if the purchase order is awarded.
2. The item will be supplied conforming to the specifications stated in this document without any defect and deviations.
3. Warranty will be given for the period mentioned in this document and service will be rendered to the satisfaction of NITK, Surathkal during this period.

Signature of the Bidder: _____

Name : _____

Business Address : _____

Place :

Date :

Seal of the Bidder's Firm

Specifications

Item: Computer-controlled Packed Bed

No. of Units: 01

General Description of the Setup:

The set-up must be made of a glass column packed with packing materials i.e. Rasching rings, Berl saddles, glass beads, etc. stainless steel mesh to support the packing and with calming section. Pressure drop across the packed bed must be measured by a manometer and DPT for data logging for different flow rates. The apparatus is close circuit type provided with tank, Pump, necessary piping, valves and Digital flow meter to measure the flow rate of fluid (BOTH manual and sensor-based data logging and control by computer interface. The set-up must be fitted on a steel support with wheels and painted with good quality corrosion resistant paint.

The set-up must facilitate to interface the system with computer which enables to log the experimental data using computer. This software package must provide a comprehensive educational software environment within which the investigations can be performed. This software must be capable to tabulate the sample readings according to the requirement of experiment under study and results obtained can be compared. The real time data acquisition must be done by interfacing the set-up with computer using software. Software must allow the user to have control on data logging, printing the stored data, preparing spread sheets in Excel etc.

Experiments/Objectives to study:

To study relationship between velocity of fluid (flow rate) and pressure drop per unit length of bed for different types of packings (at least three types as mentioned in the description). To conduct an experiment on flow of water through a packed bed and determine the effect of superficial mass velocity on pressure drop across the bed. To Verify Ergun's equation. To Compare the modified friction factor obtained from Leva's correlation with those obtained by Ergun's equation. To determine the effect of modified Reynolds number on modified friction factor.

Technical Specifications:

Packed Column: Borosilicate Glass with both end made of Stainless Steel (Nominal diameter: 50 – 80 mm). Length: 750 – 1000 mm for a particular packing material. *Three separate columns* or a single column may be used for packing each type of packing material.

Packing Material: Borosilicate Glass Rasching rings, Berl saddles, glass beads (suitable sizes)

Water tank: Made of Stainless Steel, Capacity ~ 30 L or suitable.

Water Circulation: FHP Pump Crompton/Sharp make.

Flow Measurement: Both Rotameter (manual) and Digital mass flow meter (digital/data logging)

Pressure Drop Measurement: by both Manometer/ Differential Pressure Transducer (digital)

Standard make on/off switch, Mains Indicator etc.

Instruction Manual consisting of experimental procedures, theory, procedure to operate and store data, safety measures, block diagram, Tabular columns (observation), Calculations etc. must be supplied.

The Experimental set-up must be provided with a suitable Desktop computer (for data logging/analysis of data via software).

Additional Points:

Data acquisition electronic box, with connectors for the different sensors for monitoring, collecting data and controlling the experimental unit.

All the variables like flowrates of water, pressure/pressure difference measurement, etc. should be measured and controlled by integrating it with computer using Control interface box with Advanced Real-Time Control.

National Instruments Data Acquisition board standards

There should have a provision of calibration of a sensor and check the accuracy of the sensors before taking measurements. (Calibration certificate of sensors must be provided by the supplier).

It must include a suitable data acquisition software.

The data acquisition system must be able to perform the following but not limited to.

- a. To represent the system responses curves in real time.
- b. To record all the measurement values and results in a file and export through USB to external storage devices.
- c. To plot the characteristic curves or user defined plots.
- d. To calibrate the sensors that take part in the process.
- e. Automatic calculation, recording, charting and data export for efficient use of students' and lecturers' time
- f. Real-time traces, data capture, monitoring and display of your experiment readings on a computer (PC)

Computer (1 NO.*): A computer with a LED monitor with suitable configurations should be included in the bid. Intel core i7 processor, 16 GB RAM DDR4, suitable intel chip set and graphics card, 1 TB hard disk Windows Operation System with perpetual licence (or) Better configuration is preferable. **Three years** comprehensive warranty including onsite and online support, which should reflect in the OEM website. Vendors compulsorily include the quote for a computer along with the item.

Other Requirements:

1. Vendors should provide the catalogue of the products along with detailed product specifications.
2. The Website link of the Manufacturer/product (OEM) should be provided.
3. List of customers, specifically the Government Higher Educational Institutes/ Government Research Laboratories/ Organizations to which the equipment are supplied and duly signed performance report by the organization.
4. Manufacture of the items should be done in a certified facility under the requisite quality standards and the certification documents must be provided along with the bid.
5. The instructions, required softwares, and operating procedure manuals should be supplied along with the Units/Modules.

6. All the experimental units should be installed in the laboratory and the required training should be given to the faculty and technical staff.
7. The manuals for Required Services, Assembly and Installation, Interface and Control Software, Starting-up, Safety, Maintenance, Calibration & Practices should be supplied with the set-up.
8. **Warranty:** All equipment must be provided with a minimum of **3 Years OEM Warranty**. Within this time Warranty period for the products offered should cover the repair, replacement of components, and customer support for any products not performing as per Manufacturer specifications or due to manufacturing defects.