



Indian Institute of Technology Madras

I.I.T.P.O., MADRAS-600 036.

DEPARTMENT OF CIVIL ENGINEERING

SPEED POST

Form for Inviting Quotations

Ref.No. CIE/KRAG/2017/Water Purification System

Date: 19/03 /2018

DUE DATE: 02.04.2018

Dear Sirs,

Quotations are invited for the supply of a "Water Purification System" conforming to the specifications given in the enclosed list.

1. The quotation should be submitted under the two-bid system (i.e.) Technical Bid and Financial Bid in separate envelopes sealed and superscribed on the envelope with the reference No. and due date, should be addressed to the **undersigned so as to reach on or before the due date stipulated above.**
2. The Quotations should be valid for (60) **Sixty days from the due date and the period of delivery** required should also be clearly indicated.
3. If the item is under DGS&D Rate contract No. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price (Please note that we are not Direct Demanding Officers). If so please send copy of the RC.
4. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples if called for, should be submitted free of charges, and collected back at the supplier's expenses.
5. Local Firms : Quotations should be for free delivery to this Institute. If Quotations for Ex-Godown delivery charges should be indicated separately.
6. Firms Outside Madras : Quotations should be for F.O.R. Madras. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If Ex-Godown, packing, forwarding and freight charges must be indicated.
7. The rate of sales / General Taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for Sales / General Taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have concessional Sales Tax applicable to non Government Educational Institutions run with no profit motive for which a concession. Sales Tax Certificate will be issued at the time of final settlement of the bill.
8. Goods should be supplied carriage paid and insured.
9. Goods shall not be supplied without an official supply order.
10. Payment : Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later

Details as per enclosed list.

Yours faithfully

(Dr. Dali Naidu Arnepalli)

Note: (i) Quotation should be sent by SPEED POST only or to be delivered directly concerned
(ii) Firms are requested to submit the specifications of their product along with supporting technical Documentation/brochure instead of reproducing the specifications sent by us.

Technical Specifications of Water Purification System

1. The water purification system should be able to deliver type 2 quality water (as per ISO 3696, ASTM D1193) with a capacity of 10 liters per hour (LPH) and a minimum pressure of 2 bar.
2. The water should have electrical resistivity values greater than $5 \text{ M}\Omega \cdot \text{cm}$ at $25 \text{ }^\circ\text{C}$, and the TOC should not be more than 30 ppb.
3. The quality of water produced should be able to directly feed various laboratory equipments such as weatherometer, autoclaves, glassware washers, and dissolution testing units etc. Also, the produced water should be able to be used in applications like preparation of microbiological media, buffer and pH solutions, Histology, Chemical reactions run in water, Manual glassware rinsing etc.
4. The quoted system should have a two-stage pretreatment unit, reverse osmosis unit (RO), and preferably an electro-deionization (ED) module for reliable and low maintenance operation.
5. The pretreatment units should include booster pump, a filter, activated carbon and polyphosphate granules.
6. The vendor must also supply the dedicated pretreatment-RO system for prior treatment of raw water from the tap and to be installed before the pretreatment units of the purification system.
7. The pretreatment-RO should have a flow rate capacity of 50 LPH and the treated water from pretreatment RO should be stored in two 100 Liters tanks. These storage tanks must be fitted with overflow sensor for automatic operation.
8. One of the storage tanks must be fitted with a distribution pump to provide pretreated-RO water with a pressure of at least 2 bar for laboratory purpose.
9. The material used for manufacturing storage tanks must be durable and contaminant free. The pretreatment-RO should restrict its reject rate to 40 % or less.
10. The pretreatment-RO should come with at least 3 years unconditional warranty (includes consumables, non-consumables, services etc). The required consumables must be supplied along with the system.
11. A booster pump is to be provided to pressurize the water from the tanks to the pretreatment units. The booster pump should be able to operate with 0-2 pressure at 120 Liters per hour.

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12. A pretreatment unit should have filters of 1 μm and 5 μm to minimize the clogging of the main RO unit.
13. The pretreatment unit of the water purification system should be able to remove suspended particles of size higher than 1 μm , free chlorine and colloids present in the inlet water efficiently so as to extend the life of the RO unit by preventing the clogging of the main RO membrane.
14. The pretreatment filter should have an in-built pressure sensor that takes care of low-pressure and high-pressure in the inlet line of the pump. An automatic low-pressure cut-off switch should be available when there is no water in the inlet line and also there should be a high-pressure switch cut-off to take care for conditions when outlet pressure is more than 2.7 bar.
15. The main RO unit of the system should be able to remove at least 95% of all dissolved organics, microorganisms and particles. The RO technology should also have the capability of handling high recovery of recycled water. The RO unit should be able to maintain a steady flow rate of 50 LPH or higher and the produced water as well as the RO unit should not undergo any temperature variation.
16. The main RO should be able to allow permeate of at least 70 % so as to restricts its reject rate to 30 % or lower.
17. Inbuilt electrical conductivity cells should be provided before and after the main RO unit. The main RO should be entitled to at least 5 years of warranty. The required consumables must be supplied along with the system.
18. Preferably a mixed bed ion electro-deionization (ED) module should be used with auto regeneration that operates by a supply of electric current.
19. The ED module should use carbon beads instead of using a system that employs extra softeners.
20. The ED module should use regenerated ion-exchange resin and avoid the use of costly resin that requires replacement or regeneration in the later stage.
21. The ED module should be able to allow 90 % of the effluent to go to the reservoir.
22. The ED module should come with a warranty of at least 7 years. The required consumables must be supplied along with the system for seven years of operation.
23. There should be a reservoir of a capacity of 100 liters after the complete treatment. There should be a distribution pump connected to the reservoir.

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24. There should be a sensor to detect the level of water in the reservoir and an automatic switch that takes care of this level.
25. The reservoir should have a vent filter to trap contaminants present in atmospheric air.
26. The feeding of the pure water to any laboratory appliance shall be at a flow rate of 14.5 to 16.5 L/min.
27. The water purification system should be efficient to consistently produce high-quality water.
28. There should be a highly precise and accurate measurement tool for measuring the resistivity. This measurement should indicate the actual ionic concentration in water. If there is any defect in the resistivity measuring tool, this should automatically be displayed or alarmed the users.
29. There should be a temperature measuring device that can measure with at least 0.1°C resolution.
30. The equipment should have features that can be controlled both electronically and manually. It should have features or software that allow remote access. It should also incorporate a software that can track the data in order to meet the quality requirements.
31. Any information about the system should be able to be accessed on the screen (display) provided in the system. The information should be displayed on the screen with further step by step guidance if any action has to be taken.
32. The equipment should have features that will automatically signal few days before the time for replacement of any consumables.
33. There should be a self-maintenance option.
34. The noise level of the water purification system/pump should be less than 50 Db.

General Specifications of Water Purification System

1. The system must be installed by the technical persons of the vendors/principles.
2. Proper demonstration and training should be given to the users after successful installation.
3. All the necessary accessories should be provided.
4. The equipment should be supplied with an unconditional overall warranty of 3 years (including consumables, parts, non-consumables, services etc).

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5. The list of at least five users of quoted system installations in India including contact details (name of the person-in-charge, email and phone number) is to be provided.
6. The cost should include 36-month warranty, supply, and installation at site (IIT Madras, Chennai).
7. There must be a local service agent in Chennai or nearby cities in India. The downtime should not be more than 24 hours. Details of service person to be provided during bid submission.
8. Payment conditions: 100 % after successful installation and training.
9. The vendor must be an OEM.
10. Optional items must be quoted separately.
11. The system should be delivered within 3 weeks from the date of issue of PO.
12. Individual costs should be indicated for the different items (parts) quoted. IIT Madras reserves the right to exclude some items from the purchase items must be quoted separately.
13. Costs and related information should be given only in the financial bid.

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