

**DEPARTMENT OF BIOCHEMICAL ENGINEERING AND BIOTECHNOLOGY  
INDIAN INSTITUTE OF TECHNOLOGY DELHI  
HAUZ KHAS, NEW DELHI – 110016**

FEBRUARY 14, 2013

**Subject:** Notice Inviting Quotation (NIQ) for purchase of **Ultrafiltration – Nanofiltration (UF – NF) system**


Sealed quotations are invited for supply of **Ultrafiltration – Nanofiltration (UF – NF) system, quantity - 1 (one)** in DBEB, addressed to **Prof. G. P. Agarwal, DBEB, IIT Delhi** on or before **03.03.2014 by 5.00 P.M.** All the parties are requested to read the specifications, notes and terms & conditions given below carefully before submitting the quote. The quotation must include all taxes, handling, shipping and installation charges. Also all details of guarantee/warranty should be clearly mentioned. The Technical and Financial bids should be in separate sealed envelopes and both should be placed inside a large sealed envelope inscribed with “Quotation for purchase of UF – NF system”. The Technical bid must provide all information about the components asked in the sections “Essential Technical Specification” as well as “Optional Accessories”.

**Item Name:** Ultrafiltration – Nanofiltration (UF – NF) system

**Quantity:** 01 (One)

**NOTE:**

1. IIT Delhi reserves all the Intellectual Property Rights (IPR) with respect to the equipment's design. A declaration stating NO OBJECTION regarding IIT Delhi's ownership of IPR must be submitted by the manufacturer along with quotation.
2. Design details of the equipment should not be shared to other parties by the manufacturer/vendor without obtaining permission in writing from Prof. G.P. Agarwal, DBEB, IIT Delhi, New Delhi.
3. Manufacturer must discuss the design of the equipment for any query in advance before fabricating the desired UF-NF system as per the essential technical specifications mentioned below.
4. Manufacturers must allow the end-user .i.e. researchers/buyer from IIT Delhi to inspect the final product and should obtain the satisfactory report from the end-user before delivering the instrument.
5. Complete P&I diagram must be enclosed with quotations.
6. Kindly do not send any unnecessary documents, like advertisements containing the product range list of vendors/distributors etc. along with the bids.

  
**Prof. G. P. Agarwal**  
(DBEB, IIT Delhi)

## ESSENTIAL TECHNICAL SPECIFICATIONS

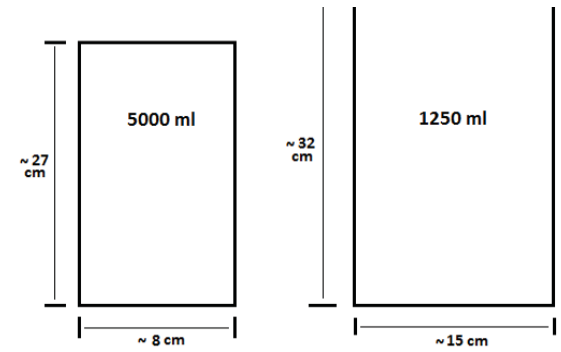
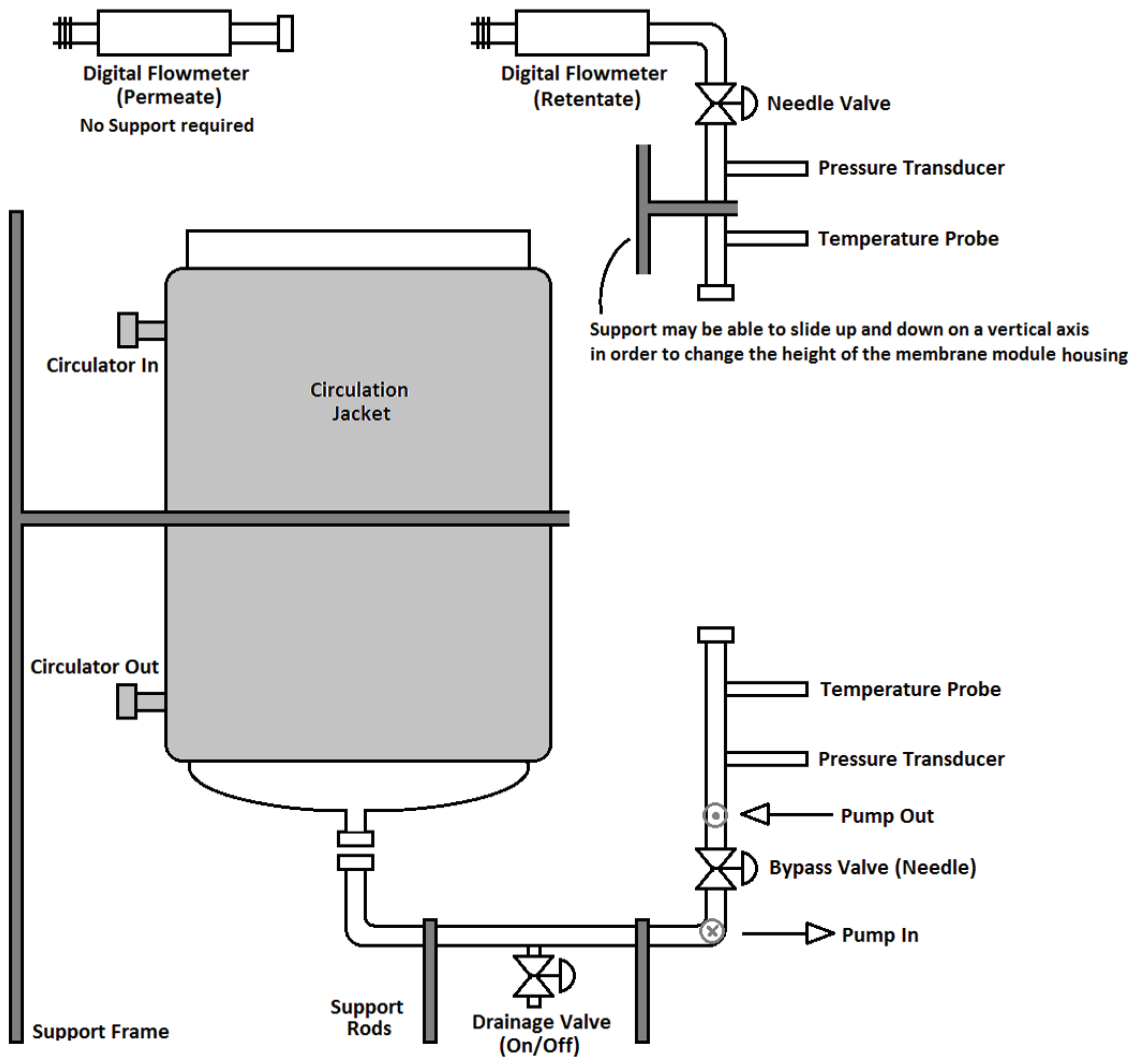
1. The construction should be of SS 316L (vessels, tubing and clamps). The O-rings should be of EPDM or material of equivalent quality. The device should be mounted on a sturdy skid (SS 304) with support rods and clamps to hold the system steady.
2. Two interchangeable feed reservoir vessels of 5l and 1.25l capacity with a jacket for temperature control via circulation of hot/cold water. The H/D of the vessel should be in the range of 2-3. The vessels should be round bottomed with baffles (fin plates with holes) at the bottom. The feed outlet should also be at the bottom of the vessel.
3. The tubing should have an internal diameter of 1/4"-3/8" and should be able to withstand up to 30 bar pressure. There should be triclover connectors (<1") with O-rings and clamps. There should be one on/off valve for drainage at the lowest point in the tubing (upstream of the pump). There should be a bypass line between the inlet and the outlet of the pump.
4. Two nos. of needle valve flow regulators (1 at pump bypass + 1 at module outlet) having a low hold-up volume (<2ml).
5. A positive displacement feed pump (piston/diaphragm) with a maximum flow rate of 5 l/min. The pump should produce pulse-less flow and should be able to operate at back pressure up to 30bar. The motor should have a variable frequency drive for speed regulation. The pump and motor should generate minimum noise and vibration.
6. Two nos. of piezoelectric/metal thin film pressure transducers (1 at module inlet + 1 at module outlet) having a measurement range of 0.1 - 30 bar. They should have a low hold-up volume (<2ml). The data is to be transmitted to the main control panel.
7. Two nos. of temperature sensors (1 at module inlet + 1 at module outlet) having a measurement range of 10 to 70 °C. They should have a low hold-up volume (<2ml). The data is to be transmitted to the main control panel.
8. Two nos. of horizontal flow meters with a low hold-up volume (<2ml). Recommended flow rate measurement ranges are –
  - a) Retentate line: 200 - 5000 ml/min;
  - b) Permeate line: 5 - 500 ml/min.The data is to be transmitted to the main control panel.
9. The control panel should display data from all digital sensors and have the variable frequency drive setting for the motor. It should also have alarm and auto shut off for excess pressure, extreme temperature and power fluctuation.
10. Fittings and housings with low hold-up volume capacity for the following modules as per design: Rayflow® flat sheet, Novasep spiral wound (2"), AMI/Filmtec spiral wound (1.8" and 2") should be provided.
11. Onsite demonstration of the system should be provided

### **OPTIONAL FEATURES:**

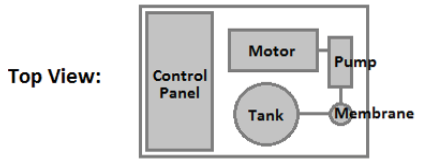
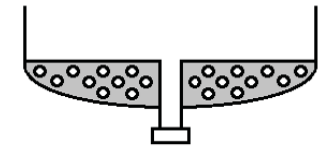
1. The flow regulators should have digital control.
2. The main control panel should have PID control for automatic control of the system. The trans-membrane pressure in the system should be controlled via control over the digital flow regulators.
3. A peristaltic dosing pump (along with appropriate tubings) with a flow rate of 2-200 ml/min. The pump can be used independently of the rest of the system.
4. The flow rate of the dosing pump should be controlled by the main control panel to match it with the permeate flow rate.
5. A water circulator with a reservoir capacity of 3-5 l and temperature control range of 0 °C to 60 °C. It should generate minimum noise and vibration.
6. Transparent window on feed tank with graduations to see and measure the contents
7. Fixed speed stirrer for the feed vessel with adjustable height
8. pH/Conductivity/ion selective probe with data feed to control panel/data logger
9. Fittings and housings for the following modules as per design: Koch hollow fiber, TAMI ceramic tubular

### **Documents to be included at the time of delivery of systems:**

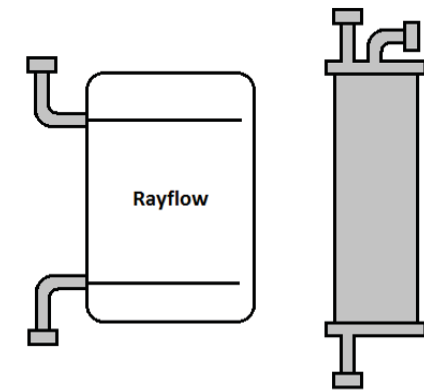
1. P&I diagrams.
2. Components list.
3. Operating Instructions Manual(s), including operating panel and safety operation warnings.
4. Maintenance Instructions Manual(s).
5. Calibration Certificate for Tubings, Gauges, Pressure Transmitter, Temperature Transmitters.
6. Documented Factory Acceptance Test (FAT) and Site Acceptance Test (SAT) results.



- > Two reservoir vessels of different capacity that can be fitted interchangeably
- > Round bottomed with finplate baffles near the outlet



Fittings required for the membrane module:



- Housing for Spiral Wound:
1. GE (2")
  2. Filmtec/AMI (1.8")
  3. Filmtec/AMI (2")

## **NECESSARY TERMS AND CONDITIONS**

1. IIT Delhi is exempted from paying custom duty under notification No.51/96 (partially or fully) and necessary “Custom Duty Exemption Certificate” can be issued after providing following information.
  - a. Shipping details i.e. Master Airway Bill No. and House Airway No. (if exists)
  - b. Forwarder details i.e. Name, Contact No., etc.Custom Duty Exemption Certificate will be issued to the shipment in the name of the Institute and Bills of Entry should be submitted to IIT Delhi later on.
2. Either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender. If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.
3. If the bidder is an authorized dealer of any manufacturer, the authorized Indian dealership certificate from the principles should be enclosed. Similarly, proprietary certificate for proprietary items should be provided.
4. IIT Delhi is exempted from paying Excise Duty and necessary Excise Duty Exemption Certificate will be provided for which following information are required. a. Quotation with details of Basic Price, Rate & Amount on which ED is applicable.
5. Please quote prices of imported items at FOB (Freight on Board) IIT Delhi inclusive of all taxes, freight, delivery, installation and onsite training charges. The quotation should provide the total price of the system including all taxes and transportation charges.
6. In case IIT Delhi is imposed with demurrage charge due to import on CIF, the entire demurrage charge has to be borne by the Indian Agent of foreign supplier.
7. A special discount/rebate wherever admissible keeping in view that supplies are being made for educational purpose in respect of public institution of national importance may please be indicated.
8. Payment Options (any one to be chosen by the Department)
  - Letter of Credit: 90% payment against shipping documents & balance 10% after satisfactory installation. For large purchase i.e. costing over Rs. 1 crore, 100% payment be made through LC.
  - Sight Draft: Payment against documents through bank.
  - Against Delivery: Payment by wire transfer after receipt of material.
  - Advance payment: pre-payment by wire transfer (for orders less than Rs. 5 lakh)
  - Against Delivery: Payment by wire transfer after receipt and installation of material.
9. Delivery period: within 1 month from the issue of supply order.
10. Warranty: at least 1 year comprehensive onsite warranty should be provided. AMC price beyond 1 year should be mentioned separately.
11. The quotations must have validity of at least three months.
12. Authority of IIT Delhi reserves the right to reject any or all quotations without assigning any reasons.