



No: PUR/2009-10/IND12017/KK

Date: 29/01/2010

Sub : Request for Pro-forma Invoice

Dear Sir

This Research Institute is interested in purchasing of the items mentioned below. You are therefore requested to forward a pro-forma invoice along with your terms & conditions of supply & payment. Please provide a copy of the technical literature and the specifications of these items in a sealed envelope.

Please read carefully the terms and conditions mentioned overleaf and submit your pro-forma invoice/quotation accordingly.

SNo.	Name of Item	Catalog No	Qty
1	Bioreactor with Illumination Facility, 7.0 - 7.5L		1

Important

- Please mention our reference number on the envelop and address all correspondence to Director IMT Chandigarh only.
- Please quote strictly as per our specifications.
- Please attach compliance sheet
- Proforma Invoice received after due date will not be considered under any circumstances.
- Please note that your Quotation should reach us latest by **23/02/2010** opened on **24/02/2010**
- **Your Quotation must be duly stamped and reach directly to IMT from you only. If quotation is submitted by Indian representative/agent then they must have to produce a authority certificate of principal party for quotating the price Other wise it will be very difficult at our end to consider your quotation.**
- **EMD Rs must be deposited along with quotation.**
- **Quotation must be submitted into two Bid System 1) Price Bid 2) Technical Bid**

Yours faithfully,

Stores & Purchase Officer.

Specification for Laboratory Scale Fermenter (Bioreactor)
with Illumination Facility

General:

- The bioreactor should be designed for microbial cell culture for batch, fed batch and continuous operation. The vessel should be made up of FDA compatible glass and designed for autoclave sterilization. The bioreactor should have facility for interchangeable vessels of different sizes. The control system should be equipped with or have facility to control at least three bioreactors using single controller. All wet parts in contact with fermentation broth/reagents/feed etc should be compatible to USP/FDA guidelines. The fermenter should be provided with microprocessor based measurement and control system with provision for battery pack with the controller to prevent loss of set points in case of power failure and have touch screen data input system.
- The bioreactor is to be provided with an illumination system with brightness adjustment at constant color temperature and light emitting angle. All equipments/parts of equipments need to be supplied by/ from original equipment manufacturer.

Vessel

The vessel should have ports (and provided with) for sparger, harvest tube, aseptic sample assembly, DO electrode, acid and base addition ports, stainless steel exhaust gas condenser, foam level detector, antifoam addition port, substrate addition ports, broth withdrawal and some spare ports for other uses.

Capacity: 7.0 – 7.5 L (all Stainless Steel parts must be of 316 L grade) with working volume of at least in the range 2.0 – 5.5 L.

Heating System/Cooling System

The temperature control of the fermenter should be by hot water with in-built heater/ chilled water through jacket.

Agitator

Drive: Top driven system with mechanical seal/ aseptic leap seal/ magnetic drive.

Range: At least 50-1000 rpm, with accuracy of ± 2 rpm.

Control: PID

Sensor: Photo-optical Encoder or Tachometer

Indication: LCD

Type of impeller: Rushton turbine impeller to be provided in adequate nos (at least 03 nos must be provided).

Aeration

2 gas system, interactive with DO Control

Air supply capacity: 20 L/min

Air filter assembly must be included.

Ring sparger must be provided along with suitable sterile air filter assembly. The sparger should not clog or choke at high cell density.

Should have suitable SS exhaust condenser along with suitable exhaust air filter assembly.

Flowmeter

Air to be measured and controlled by Mass flow controller (TMFC). Additional manual rotameter should also be provided.

Range : 0 to 20 L/min

Temperature

Sensor: RTD/ Pt 100

Range: At least 5°C above cooling water temperature up to 70 °C or, more with an accuracy of ± 0.1 °C

pH

Set point range: 2-12

Control: PID, with facility for dead band and control by addition of acid and base.

Indication: Digital display

Probe: pH probe with plug and cable.

Dissolved Oxygen

Probe: Fast response Dissolved Oxygen probe with cable.

Control: 4 stage PID Cascade control function with any one and any combination (simultaneous) of four parameters (stirrer speed, aeration rate, gas mix and substrate feed) (for example: all the parameters may need to be cascaded at the same time and run simultaneously).

Capable of controlling DO in a range of 0-100% saturation (accuracy: $\pm 5\%$ of set point).

Foam/Level Control

Foam/level probe with cable

Pumps

Minimum 3 nos. of peristaltic pumps. Steam sterilizable silicone/any other tubes for peristaltic pumps, compatible with USP/ FDA guidelines for biopharmaceuticals, must be included.

Illumination System

- Cold light source
- Fiber optics based illumination probes, sterilizable in-situ in bioreactor.

- Brightness adjustment at constant color temperature and light emitting angle.
- Provided with facility for insertion for color and daylight filters.
- Color temperature at 100% intensity: ~3400K.
- Illumination intensity at 110% voltage at light guide input: Minimum 12 Mlux.
- Housing: SS 304 or Metal powder coated.
- Filters: Daylight, Green, Blue.
- Fiber optic sensor: Two additional fiber optic sensors in addition to one that is to be supplied with the system.

Warranty

2 years complete warranty for all systems/parts supplied from the date of installation.

Optional

- Other type of impeller available with the system.
- Fiber optic sensor
- All filters compatible with the system
- AMC rates for 3 years following 2 years warranty .
- *Hardware and software for data logging and fermentation process control:*
Windows based Supervisory Control And Data Acquisition (SCADA) software for monitoring and control of various parameters. It should have capability to control at least three fermenters. Must have facilities for process validation, batch management features, multi-parameter display on monitor, time based programming of set points, ability to set both high and low limits and alarms, graphic/plotting, off-line data integration etc. and batch reports.

A suitable computer (Branded: DEL/HP) with 17" TFT monitor, printer (laser jet).

Other conditions

- Only reputed manufacturers of fermenters with considerable experience in this area or their authorized representatives/agents need to quote. List of Indian users for similar equipment must be enclosed. It is mandatory to enclose a certificate from at least three Indian users working in Biochemical Engineering/Fermentation related work for the similar equipment from National Laboratories/Institutions/reputed Biotech Industries to the effect that they are satisfied with the performance of the equipment and service of the supplier over a reasonable period of time.
- The original equipment manufacturer must be in operation having installations in India for at least for last 5 years.

- Must supply operation and service manual of all equipments/accessories.
- A letter from Original Equipment Supplier must be enclosed to the effect that the equipment to be supplied are based on their latest proven technology and they will support the equipment at least for a period of 5 years after the expiry of warranty (total of 7 years from the date of installation).
- Quote for essential spares and consumables for 3 years must be enclosed as optional items.
- Operating condition: 220 – 240 V, 50 Hz, 1 Phase

TERMS & CONDITIONS

Commercial

- 1) Cost** : Mention the price of the material in the FOB/FCA including inland freight value only. Please note that being a Govt. Organization we cannot make Advance Payment.
- 2) Insurance** : Consignment should be insured through National Insurance Company of India or its associate in your country.
- 3) Freight** : The dispatch of the material should be through Air India preferably.
- 4) Agency Commission** : Mention the percentage of Indian Agency Commission payable to commission Indian Agent in INR and also mention the name of your authorized Indian Agent/Representative, Pro-forma invoice without mentioning Indian Agency Commission will not be considered at our end.
- 5) Validity** : The validity of your pro forma invoice should be less than 180 days from the date of opening.
- 6) Warranty** : Mention the warranty period of equipment after satisfactory installation. 10% Bank Guarantee is to be submitted by you/your Agent for the Equipments costing Rs.25 Lac & above
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General Condition

- 1) Zerox copies of latest price list applicable list may be enclosed applicable in Indian Market.
- 2) Ensure that quoted price will not be higher to any other customers in India to whom this particular item have been sold particularly to govt. of India Organization.
- 3) Sent a certificate that the equipment is of latest technology & will not be obsolete within 5 years.
- 4) Ensure that all essential spares parts of this equipment will available in India with your Indian Agent as and when required.
- 5) Provide the list of the users in India of the same equipment along with their contact / email address.
- 6) Enclose a copy of agreement with your authorized Indian Agent.

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