

GENERAL INSTRUCTIONS

1. Quote separately for the basic unit and all add-ons or accessories as well as minimum spare parts. Taxes, duties etc. should be mentioned separately.
2. Provide a list of clients and after sales service reports from a few reputed clients.
3. The validity of the tenders should be for minimum of 90 days from the date of submission.
4. In case vendor wants to submit tender document for multiple items, please make separate tender sets each accompanied with the required tender document fees & Bank Guarantee.
5. The various taxes and duty concessions for the ICT are as follows:
 - Octroi - Nil
 - Excise - Nil
 - Add. Custom Duty - as applicable (9.36%)
(against Custom Duty Exemption certificate of DSIR issued to ICT) Form of Certificate Concession for Central Sales Tax (CST) only out of Maharashtra.
6. Indicate custom clearance charges and transport charges separately. We will provide the necessary documents and custom duty as given in 5 above. We may require your services to clear the goods from customs.
7. A **demand draft** drawn in favor of “Institute of Chemical Technology, Mumbai.” Tender document fees as per the table given below must be attached with the tender. Please mention Sr.No. and name of the equipment with name of the Company and full address of the Company behind the demand draft.
8. **Separate Bank Guarantee** drawn in favor of “Institute of Chemical Technology, Mumbai.” along with your quotation. The following are the charges.

No.	Cost of Item (Rs)	Tender document fee (in Rs.) (Non-refundable)	Bank Guarantee (% of the Estimated Cost of item) (Refundable)
1	3,00,000 or more but less 10,00,000	Nil	Nil
2	10,00,000 or more but less than 50,00,000	2000/-	2.5
3	50,00,000 or more	2000/-	4

9. Tenders must seal before submission in the Administration department. The envelope must indicate on the top item serial number and tender due date. This will enable us easy identification and sorting.
10. Tenders without **separate Bank Guarantee and tender document fees** will be rejected.
11. For any clarification, contact Superintendent, Stores (ICT) Tel.No. 022- 33611301/ (Ext. 1301).
12. Vendor to do installation and commissioning of the instrument and training free of cost. We may required installation report.

13. It is also desired that the company to quote for the warrantee and post warrantee terms neatly and very clearly in the form of service contract.
14. Vendor must be prepared to undertake the site preparation job in case required.
15. The quotations/tenders should be submitted by the actual manufacturers or their authorized agents with necessary documentation.
16. The Vice-Chancellor, ICT reserves the right to order in part full quantity or withdraw the requirement in part or in full without assigning any reason.
17. The tender shall be accompanied by registration document, income tax clearance certificate and details of similar works executed.
18. We reserve the right to reject any offer without assigning any reason.
19. No enquiries will be entertained after submission of the quotation.
20. Quotation received after the due date will not be considered.
21. The Vice-Chancellor, ICT takes no responsibility for delays/loss in post or non receipt of tender Documents/tenders.
22. Sealed tenders must be submitted on or before **18th December, 2013** up to 5.00 p.m. in the Information Department.

Advertisement in Times of India on 29th November, 2013.

Registrar, ICT, Matunga, Mumbai-400 019.

Item No. 1

Retort Unit:

Horizontal, Steam Air Type.

A] Kettle

- Capacity
 - 150 Kg
 - Suitable For Wet Food Processing
 - 500 Pouches of 300 gms Each

- Operating Conditions - 121⁰C , 15 psig
- Design Pressure -4 Atmospheres Minimum
- Material Of Construction - SS 304
- Insulation - Suitable
- Approximate Size - 1500 Liters

- The Retort unit should have suitable arrangement for Loading, Unloading of food packs in the Trays and Trolleys.
- The pouches should have necessary protection arrangement to prevent leakages / breakages due to pressure vacuum shocks.
- The unit should have water sprays for quick cooling of the food after processing.
- The retort unit should PLC based fully automatic control system with pre programmed selection for time- temperature combinations.

B] Steam Generator (Boiler)

- 400 Kg/ hr Steam generation Capacity
- Steam Pressure upto 5 Bars

C] Cooling water recirculation system

- Cooling circulation pump
- Cooling tower
- Compressor for cooling tower

D] Accessories

Retortable Grade Sealing Machine- Vertical model (Convenient for Sealing Liquid products)

Note: Items B], C], D], should be **quoted separately**.

All the capacities and specifications should be such that those facilities are used for Item A] to serve as a “**complete Retort Unit**”.

- 1) Please send your best quotation (Item wise) stating Tax and other levies separately, including packing, forwarding and insurance.
- 2) Also attach technical literature and any other relevant information along with list of clients.
- 3) Other Terms:
 - Free Delivery at project site (Satara, Maharashtra)
 - Free Installation, commissioning & Trials at Project site, Satara.
 - 10 % retention amount will be paid after satisfactory installation, commissioning and test trials.
- 4) Clearly State delivery period.

Delayed delivery may attract penalty clause as decided by ICT rules.

Item No. 2

Particle Size analyzer with capability of measuring zeta potential and molecular weight

Specifications:

Parameters measured	Size, Zeta potential and protein mobility Molecular weight
Temperature control range	0°C to 90°C +/- 0.1°C**
Condensation control	Purge using dry air
Standard laser	10mW, 633nm
Correlator	25ns to 8000s, max 4000 channels
Size	
Absolute sensitivity (Toluene kcps)	300
Range (Maximum diameter)	0.3nm - 10 microns*
Min sample volume	12µL
Min concentration, protein	0.1mg/mL 15kDa protein
Min concentration, forward angle	1mg/mL 15kDa protein
Max concentration	40% w/v*
Measurement angles (water as dispersant)	
Analysis algorithms	General purpose NNLS, multiple narrow modes, protein
Sensitivity	1mg/mL 15kDa protein
Zeta potential range	> +/-500mV
Mobility range	
Maximum sample concentration	40% w/v

Minimum sample volume (using diffusion barrier)	20 μ L
Maximum sample conductivity	200mS/cm
Signal processing	M3-PALS M3-PALS
Molecular weight	
Molecular weight range	<1000Da - 2 x 10 ⁷ Da*
Molecular weight range	<1000Da - 2 x 10 ⁷ Da*
Protein measurement software	included
MPT-2 Autotitrator and degasser	included
Dip cell	included

21 CFR part 11 software or Research Software with Computer and printer

The quote should include three years warranty at least 5 years of annual maintenance contract along beyond the warranty period.

Options

High concentration cell	Optional
Surface zeta potential cell (sample 5mm x 4mm)	Optional
SV-10 viscometer	Optional
Microrheology software and Measurement capability	Optional
Research software	Optional

Item No. 3

Particle size analyzer

Specifications:

Particle size

Signal Processing: Dynamic light scattering (DLS)

Size range: 0.3 nm to 6 μm

Sample volume: 10 μL , 1-3 mL

Minimum sample volume: 10 μL

Sample type: Most colloidal sized material suspended in any clear liquid (organic solvent and water)

Sample cell Temperature Control: $-0.5\text{ }^{\circ}\text{C}$ to $110\text{ }^{\circ}\text{C}$, $\pm 0.2\text{ }^{\circ}\text{C}$

Scattering angel: Minimum two angles. 90° detector for diluted sample.

Precision: 1%, typically

Laser: 35 mW red diode laser, nom 660 nm

Correlator: Cover the equivalent of 107 linearly spaced channels, 100% efficiency, and real-time operation over the entire time range

Condensation control: Purge facility using dry air

Software: Integrated database software connection to system for data recording. Free unlimited software installation for data analysis on multiple computers

Cuvettes (sample holding cell): Polystyrene, Glass, Quartz, folded capillary, dip cell for aqueous, inorganic, organic all type of samples

Desirables:

Up-gradation: *Upgradable to zeta potential analyser. (estimated cost for upgradation may kindly be mentioned)*

Training: Onsite training for two users for two days

Warrantee With warranty

Item No. 4

Particle size analyzer with zeta potential

Specifications:

Particle size

Signal Processing: Dynamic light scattering (DLS)
Size range: 0.3 nm to 6 μm
Sample volume: 10 μL , 1-3 mL
Minimum sample volume: 10 μL
Sample type: Most colloidal sized material suspended in any clear liquid (organic solvent and water)
Sample cell Temperature Control: $-0.5\text{ }^{\circ}\text{C}$ to $110\text{ }^{\circ}\text{C}$, $\pm 0.2\text{ }^{\circ}\text{C}$
Scattering angel: Minimum two angles. 90⁰ detectors for diluted sample.
Precision: 1%, typically
Laser: 35 mW red diode laser, nom 660 nm
Correlator: Cover the equivalent of 107 linearly spaced channels, 100% efficiency, and real-time operation over the entire time range
Condensation control: Purge facility using dry air
Software: Integrated database software connection to system for data recording. Free unlimited software installation for data analysis on multiple computers
Cuvettes (sample holding cell): Polystyrene, Glass, Quartz, folded capillary, dip cell for aqueous, inorganic, organic all type of samples

Zeta potential measurement:

Size range suitable for measurement: 10 nm to 100 μm
Zeta potential range: -220 mV to 220 mV
Maximum sample concentration: 10% w/v
Minimum sample volume: 180 μl
Maximum sample conductivity: 300 ms/cm (30 S/m)
Signal processing: Phase analysis light scattering

Molecular weight (optional)

Molecular weight range (estimated from DLS): 1 kDa to 25 MDa
Molecular weight range (Debye plot): 1 kDa to 25 MDa
Principle and technique: Laser Doppler electrophoresis
Cuvettes (sample holding cell): Polystyrene, Quartz, Glass, folded capillary, dip cell (aqueous, inorganic, organic all type of samples) with palladium plated electrode for zeta potential determination.

Desirables:

Training- Onsite training for two users for two days
Warrantee- With warranty

Item No. 5

Nano Spray Dryer with dedusting scrubber

Specifications:

- **Advanced Model with**
 - 1) Multicolour Touch Screen
 - 2) Teflon membrane auto dedusting scrubber
 - 3) Ultrasonic Spray Nozzle with Broadband Ultrasonic Frequency Generator & Power Cord
 - 4) Programmable Ultrasonic Atomizer Device
 - 5) N2 Inert Loop

General specification:

- **Suitable for:** Aqueous / Aqueous + Solvents / Solvents Feeds.
- **System Qualifications:** CE Certification issued by international approval authority (Quality control mark for the equipments).
- **Evaporation Rate:** 1000ml of water evaporation/hr at max. drying air flow rate in insulated condition
- **Drying Temp.:** Ambient to 2500 C; Accuracy ± 10 C; in steps of 0.10 C through PLC.
- **Air Heater Capacity :** 3.0 KW
- **Aspirator Blower Capacity :** 118 Nm³ /hr; 0 to –250mm of water column vacuum with variable frequency drive; in steps of 1% of capacity; controlled through PLC.
- **Aspirator Blower's Motor:** 0.50 HP x 2900 rpm 3 phase FLP – Motor with Single Phase 230V AC input & Three Phase 230V AC Output.
- **Feed Pump Capacity:** 1250ml /hr with 3 mm ID tube Controlled through PLC in steps of Capacity 1% of Pump Capacity.
- **Compressed Air For feed Atomization:** Non Lubricated – 5-8 bar, 200-800 lit/hr
- **Spray System :** Co- current – 0.7mm, two fluid spray nozzle.
- **Built-in hot plate with Magnetic Stirrer:** Capacity – 1 lit hot plate with Magnetic Stirrer controlled through PLC in steps of 1% accuracy + 1%
- **Air Pressure Regulator Cum Filter for Spray Atomization:** Janatics Make suitable for 0 to 10 kg/cm²

Specification for dedusting scrubber:

- **MOC – Filter Media :** Non Woven PTFE Fluoro polymer bonded with PP strengthening media
- **System Efficiency:** 70 to 90%
- **Details of Filter Media:** Stabilised Pore Configuration 0.3 Micron; Hydrophobic For Venting; High Retention Efficiency; Non Clogging Characteristics; Highly Effective Filter Media; Ultrapure – Chemically Inert; Compatible With All Solvents, Acids, Alkalis; Suitable Upto Gas Temperatures of 2040 C; Self Supporting Media; Non Stick Nature; Can Be Sterilized With Steam Or Bactericidal Solution; Washable & Reusable.

Specification for Ultrasonic Spray Nozzle with Broadband Ultrasonic Frequency Generator & Power Cord

- **MOC of**
 - i) **Wetted parts:** Titanium alloy 6AI – 4 V

- ii) **Nozzle Housing** : S. S. 316
- iii) **Precision Holder** Anodized Aluminum
- v) **Liquid Inlet**: Tefzel
- vi) **Cooling Gas**: S. S. 316
- **Cooling Gas pressure / temperature** 0 – 2 psi / ambient
- **Operating Temperature** 20 to 1500C
- **Operating Frequency** 60 KHz / 120 KHz
- **Nozzle dimensions** : Stem dia - 25 mm \pm 0.1 mm
Stem length- 140 mm

Technical Specifications of Programmable Ultrasonic Atomizer Device

- **Frequency Range**: 20 – 120 KHz
- **Controls**: Microcontroller Operated with Auto adjustment of Frequency with reference feed flow rate
- **Operating Temperature**: 0 – 400C
- **Type** :Stand alone type
- **Display**: Digital electronic display of wattage applied

Technical Specification of N2 Inert Loop

- **Suitable for**: All Solvents
- **Inert Gas to be used**: Nitrogen - 99% pure
- **Gas Flow Rate**: 50 CFM
- **Nominal Capacity**: 1710 Btu / hr.
- **Operating pressure**: 10 to 50 mm of WC
- **Outlet Gas Temperature**: < Ambient Temperature
- **Main Body Enclosure**: SS 304 with GMP finish mounted on castor wheels
- **Condensation System**: Consists of Refrigeration compressor, chiller, Plate heat exchanger for condensation with solvent condensate drain system.
- **O₂ ppm monitor/sampler**: O₂ Analyser transmitter
- **Controls & Safeties for Condensation System and O₂ Analyser**: HP cut off switch; Anti defrosting cut off; Dual Alarm system.

Item No. 6

FT-IR Spectrometer

Specifications:

- The instrument spectral resolution should be 0.8 cm⁻¹
- **The standard spectral operating range should be no less than 6,000 - 500 cm⁻¹ for ZnSe optics.**
- Signal to Noise Ratio typically >50,000:1
(1min measurement time, spectral resolution 4cm⁻¹)

It should be portable having dimensions of 22 x 33 x 26 cm (w x d x h) with ATR and should weigh less than 7.5kg

- Spectrometer components like source, laser, detector, and interferometer must be continuously monitored for operation within factory specifications. The operator must be immediately notified by system software if any of the factory specifications are not met. The software must offer detailed information about the nature of the failure and suggest possible remedy.
- Optical components like detector and source must be electronically coded, so that these components are automatically recognized when placed in the spectrometer. Appropriate parameter must be automatically transferred to the application software.
- **Optics & Beam splitter should be ZnSe to work smoothly in high humidity area. Only ZnSe windows will not be acceptable.**
- **Sampling modules such as ATR is a must for analysing solids, liquid, Powders, gels, paste and semi liquid. Change between different modules must be easy.**
- Sampling modules must be automatically identified and spectral test routines must automatically start to verify accessory performance.
- The FT-IR must incorporate a high throughput interferometer and Gold Coated optics for maximum light throughput.
- The interferometer must be permanently aligned. Interferometer design. System that require alignment (either manual or automatic) are not acceptable.

- The interferometer bearing mechanism must be wear-free (frictionless) design to ensure unlimited lifetime . Bearings with wear are not acceptable as they require frequent maintenance and costly exchange.
- The interferometer must utilize retro reflecting cube corners for instantaneous correction of instability due to mirror tilt.
- The system must include a replacement desiccant.
- The system must incorporate an automated internal instrument validation unit. The internal validation unit must be able to incorporate different validation standards and be fully software controlled. This instrument validation must not require user interaction and must produce a report documenting the results of the validation tests.
- Communication between the spectrometer and controlling PC must be performed using an Ethernet protocol.
- **Additional warranty for 5 years on Interferometer & 5 years on Laser Source should be quoted.**
- System should be offered with accessory for UV-VIS monitoring.

SOFTWARE specifications:

- The software must be an "all-in-one" software for data measurement, manipulation and evaluation.
- The software must come with a step by step assistant.
- The software must include search capabilities as well as the possibility to create user own libraries.
- The software must come with a free starter library.
- The software must come with a quantification tool.
- The software must come with an easy to use graphical macro editor.
- The software must include an automatic instrument test (OQ/PQ).
- The software must allow multi level user management.
- The software must be GMP/GLP conform.

FTIR Accessories required are:

- ATR unit with Diamond Crystal
- Standard Library
- Latest All-in-one PC & Laserjet B&W Printer.

Optional Local Accessories

- 15 ton Hydraulic press
- KBR Die 13mm
- Agate Mortar and Pestle
- Liquid Demountable cell with NaCl window.
- IR grade KBr Powder 50 gm min.

Item No. 7

MICROWAVE REACTOR

SPECIFICATIONS :

MICROWAVE REACTOR WITH TEMPERATURE CONTROL, UV-LIGHT & ULTRASONIC SYSTEM (MODEL :UWave-1000)

From: Sineo Microwave Chemistry Technology Co. Ltd., Shanghai, China.

SPECIFICATION :

- Single magnetron with rotating diffuser for homogenous microwave distribution in the cavity.
- Magnetron protected from reflected microwave energy.
- Installed and delivered microwave power is **1000 watts**, controlled via microprocessor.
- Dynamically adjust microwave power to generate non-pulse and continuous microwave heating.
- Cavity is made up of stainless steel with **PTFE plasma coating** for corrosion resistant.
- Cavity illumination.
- Temperature ranges from room temperature to **300°C**.
- All hardware protected against organic fumes with **polymer coating**.
- Cavity had sufficient space to accommodate higher reaction vessel.
- The system and cavity had good safety and interlocking and pressure responsive.
- Inbuilt exhaust system to cool & drive away fumes if any in the cavity.
- Dual channel **IR & Pt temperature sensor** supports surface & internal temperature (non-contact) monitoring of reactant.
- High precision IR temperature sensor provides high sensitivity and no delay effects, generating a safe and convenient operating platform for microwave reaction application.
- Two type of stirring device (mechanical & magnetic), stirring device is transferable, and speed is continuously adjustable & visible in screen.
- Equipped with condenser & circumference.
- Purging of nitrogen gas **or inert gas is equipped**.
- **Dual screen display** for reaction data and accumulating temperature curve.
- **TFT color LCD** screens for monitoring and recording (through connecting to VCR) the whole reaction process.
- Preset reaction methods, there are more than **5 reaction variables** changeable in each method e.g. time, temperature, step, microwave power, stirring speed, etc.
- System controlled in respect with time, temperature and power programme.
- Screen VGA resolution of 640 X 480 for sharp process graphic.
- System is attached with **UV-light & Ultrasonic system**.
- Humanistic programmed working platform to operate any three energies-**microwave, ultrasonic & UV-light simultaneously or separately**.
- **UV-Light setup**
UV-lamp for photochemistry, **wavelength 365 nm**.
- **Ultrasonic setup**
Ultrasound generates a frequency **upto 26~28Khz**

Ultrasonic power is **adjustable continuously & alarm functions for self-check**.
- Reaction vessel for homogenous/heterogeneous, solid phase reaction, reflux reaction from **25ml to 1000ml (glass or quartz)**.

Item No. 8

Specifications for Fuel Cell Kit:

System Specifications: Quotations for all 6 systems

System →	1	2	3
Rated output (W)	40	360	1200
Rated current (A)	8	15	52
Output voltage (V) DC	5 -10	22 - 42	22 - 36
Hydrogen consumption (SLPM)	0.7	4.4	15
Design	open cathode, air cooled	closed cathode, liquid cooled	air cooled, open cathode

System →	4	5	6
Rated output (KW)	4	8	12
Rated current (A)	175	350	350
Output voltage (V) DC	22-40	22-40	30-60
Hydrogen consumption (SLPM)	56	120	170
Design	Closed cathode, liquid cooled	closed cathode, liquid cooled	Liquid cooled, closed cathode

Item No.9

HOT STAGE POLARISING MICROSCOPE:

Specifications:

Hot And Cold Stage microscope thermal stages are designed specifically with liquid crystal applications in mind.

Polarizer:360° rotatable stage

Temperature range	: Both stages Heating and cooling
	Coolin : Room temperature to – 50 °C
	Heating: Heating: Room temperature to 600°C
Objective turret	6x (M25), Centerable, absolute encoded
Objectives	HI Plan POL N Plan POL PL Fluotar POL
Usable field of view	long working Stages: 25 mm
Contrast method	Motorized
Changeover	
Color reproduction	CCIC: Constant Color Intensity Control
Transmitted light	Polarization contrast Orthoscopy Conoscopy Brightfield Phase contrast DIC Darkfield
Incident light	Polarization contrast

	Brightfield
	Darkfield*
	DIC
	Fluorescence
Conoscopy	Fully integrated conoscopy beam path, additional 1.6x mag. changer, coded User guidance with display feedback Advanced conoscopy module (manual)
Transmitted light axis illumination	High power LED
Operation	Motorized Integrated illumination manager
Incident light axis	Motorized, High power LED Integrated illumination manager, round and rectangular field diaphragms for ocular or camera observation
Condensers	Motorized changeover of condenser head, 7x condenser disc, polarizer
Focus drive	Manual, 2-gear gearbox Motorization on request

Lens Specifications

	20 X LCD	50 X LCD	100 X LCD
N. A.	0.45	0.70	0.85
W. D.	8.3 – 7.4	3 – 2.2	1.2 – 0.9
F. N.	26.5	26.5	26.5
Glass Thickness Correction	0 – 1.2	0 – 1.2	0 – 0.7

Optional:

	100 X IR	20 X IR	50 X IR
N. A.	0.85	0.45	0.45
N. V. D.	1.2	8.3	4.5
R. N.	22	22	22
Glass Thickness Correction (mm)	0 – 0.7	0 – 1.2	0 – 1.2
Silicon Thickness Correction	0 – 1.0	0 – 1.2	0 - 12

Item No. 10

CHNS (O) Analyzer

Specifications:

To determine the percentages of Carbon, Hydrogen, Nitrogen, Sulphur and Oxygen of organic compounds, Operating Mode Simultaneous (CHNS); (CNS); (S); (O); (CHN); (CN); (N)

Oven Temperature range Up to 1900C

Furnace temperature Up to 1100°C for all operating mode

Combustion Temperature Up to 1800°C

Oxygen Injection (Volume/ Pressure) Set via software or microcontroller

Sample introduction Via Auto sampler

Safety Sensors for high temperature compartment and transformer.

Practical working range up to 100% Analytical Ranges

C 0.001-3.6 mgs

H 0.001-1.0 mgs

N 0.001-6.0 mgs

S 0.001-2.0 mgs

O 0.001-2.0 mgs

Item No. 11

Contact Angle Analyzer

Specifications:

To measure Surface Tension, Interfacial Tension with the help of Wilhelmy plate and Du Noüy ring

- Contact Angle of Solid, Bundled Fibers, Single Fiber, Woven, Non Woven Textiles Samples etc.
- capable of measurement of Density of Liquid, Sedimentation, provision for Fully Automatic Measurement of CMC
- Method of Measurement : Ring and Plate measurement using Electronic Balance only
- Measuring range for surface and interfacial tensions : 1 ... 1000 mN/m ; ± 0.01 mN/m resolution
- Measuring range for contact angles : $0^\circ \dots 180^\circ$; $\pm 0.01^\circ$ resolution (0° to 90° for Washburn

Method)

- Measuring range for densities : 0.50 ... 2.50 g/cm³; ± 0.002 g/cm³ resolution
- Weighing range : 100 μ g ... 210 g
- Weighing Resolution : 100 μ g
- Movement of Table : Should be Electrically driven & software controlled
- Travel speed of sample table : 2 μ m/s ... 60 mm/min
- Calibration : Should be automatic and software controlled
- Software Module for Surface Tension and Interfacial Tension
- Measurement of the static, time and temperature dependent surface and interfacial tensions according to the Du Noüy Ring method and Wilhelmy plate method
- Force-based measurement of the dynamic contact angle of prismatic and cylindrical solids (e.g. plates, films, rods and single fibers) as well as the wetted length according to the Wilhelmy method.
- Analysis of the surface free energy of solids as well as their components (e.g. dispersive, polar and hydrogen bond parts, acid and base portions, respectively)
- Calculation of work of adhesion
- Adsorption measurement on powders and fiber bundles with the determination of the average contact angle according to the modified and the extended Washburn method
- Accessories and Software for Measurement of Density of Liquid, Sedimentation, for Fully

Automatic CMC Measurement

- Optional accessories: • Sample Vessel with 70 mm Dia suitable for SFT and IFT, made Borosilicate glass
- Wilhelmy Plate, • Du Noüy-ring, • Sample holder for solids in plate form , • Sample holder for films, Textile Yarn, • Sample holder for single fibers with Dia 100 μ m
- Sample holder to determine the wetting behavior of adsorbing materials like bundled fibers etc

Item No. 12

Digital Printing Machine:

Specifications:

For digital printing of woven and knitted, cotton, pet, wool etc. Printing width of the machine maximum 72.8"

Printing mode 4/6/8 colour

Replaceable ink option : Yes

Ink type Reactive, Disperse, acid and pigment

No. of heads available minimum 6

Take up Automatic

Printing resolution minimum 720 dpi

Item No. 13

Electrospinning machine

Specifications:

Used for production of Non-woven meshes, aligned nanofiber sheets and multi-layer nanofiber sheets Achievable DC Power upto 3 kilowatts

Achievable Voltage Upto 400 KV

Output voltage Can be adjusted from zero to maximum output voltage

Connectors High Voltage Cable

Input power cord

Voltage current monitor

Syringe Multiple

Safety feature Safety door lock system

Exhausting system to evacuate evaporated solvents and flying nanofibers.

Item No. 14

Fabric Conductivity Analyzer (Surface and Volume resistivity Measurement system)

Specifications:

To Measure surface and volume resistivity of textile materials in the range of 10^3 to $10^{16} \Omega$ with high accuracy. It should be capable of autoranging over the full span of ranges on current, resistance, voltage and charge measurement. It should have the capability for

- Determining relationship between resistivity and the level of source voltage used.
- Measuring high resistance using voltage reversal technique
- Being operated via a computer controller for optimization of test parameters such as delay time, voltage
- Capable of measuring resistivity value of Textile materials for varying conditions of humidity & temperature and its correlation.

Item No. 15

Static charge Analyzer

Specifications:

To measure static charge on the Textiles • Input voltage - 100 VAC \pm 10% (50Hz)

- Capacity- 100 VA
- High-voltage- H.V. (applied voltage for corona discharge): 0 to 10 kV
- Power supply output- CAL (applied voltage for calibration): 0 to 3 kV
- Operating temperature range - 0 to 40 deg C
- Operating humidity range - 20 to 90% RH (non-condensing)
- Allowable ambient temperature range - 0 to 40 deg C
- Output signals - ANALYZER terminal: for the analyzer,
- SYNC terminal:
• for the oscilloscope, Voltage - 0 to \pm 10 V, Accuracy-
• Approx. 10%
- Main unit dimensions - 420×450×280 mm (WXDXH)
- Weight - Approx. 33 kg
- Accessories - Power supply

Item No. 16

Moisture Analyzer

Specifications:

To analyzer moisture content of Fabric, Chemicals & Auxiliaries Weighing Capacity 150 gm

Readability in mg 1mg

Readability in % 0.01%

Display Modes for results % Moisture

% Dry weight (solids)

% Ratio,

Moisture analysis mode Automatic /Semi Automatic

Display Backlight LCD display

Communication port Yes

Temperature range 400C – 2200C with 1 deg increment

Item No. 17

Nano Particle Size Analyzer

Specifications:

Particle size range from 20 nm to 2400 um

- Instrument should have high speed analysis with continuous measurement function. Minimal time of interval of 1 sec will be preferred.
- Concentration range for particle size distribution should be wide to cover samples from 0.1 ppm to more than 15%
- System should be based on Fourier optical system being stable, reproducible and precise results.
- System should have one LASER light source for entire range as to avoid changeover time and errors observed in dual source system
- Particle size analyser should have minimum 80 detector elements for high resolution results. To get reliable results detectors should be arranged in front, side as well as back side to measure scattered light.
- Vendor should quote accessory for wet samples with inbuilt ultrasonic bath with variable mixing options. Mixing and wet sampling should be automatic. Magnetic stirrer will be preferred for easy handling and uniform mixing
- System should be quoted with dry powder accessory as optional. Dry accessory should have detection capability for at least 340 nm for powder samples and 2400 um for higher level.
- Small volume analysis for less than 15 ml volume should be possible. Vendor can quote additional accessory or part required to be used with main system.
- Vendor can quote suitable accessory for high concentration samples of 15% optionally.
- Windows based licensed operating s/w should be supplied along with instrument. S/W should be able to provide data for automatic calculation of refractive index, data for particle size detected by individual detector for more reliability.
- All required essential items like PC, printer, Air compressor, Vacuum cleaner etc to be quoted separately along with instrument.

Item No.18

Water Vapour Permeability (Transmission Tester) Tester (MMT)

Specifications:

To measure dynamic liquid transport properties of knit and woven fabrics in three dimensions...

1. Absorption Rate - Moisture absorbing time of the fabric's inner and outer surfaces.
2. One-way Transportation Capability - One-way transfer from fabric's inner surface to outer surface.
3. Spreading/Drying Rate - Speed of liquid moisture spreading on fabric's inner and outer surfaces.
MMT consists of upper and lower concentric moisture sensors. The specimen is held flat under fixed pressure between the sensors while standard test solution is introduced on to the top surface of the fabric. Electrical resistance changes between the upper and lower sensors are then recorded dynamically on computer.

MMT permits the measurement of the following indexes:

- Wetting Time Top/Bottom (WTT/WTB)
- Absorption Rate Top/Bottom (TAR/BAR)
- Maximum Wetted Radius Top/Bottom (MWRT/MWRB)
- Spreading Speed Top/Bottom (TSS/BSS)
- Accumulative One-Way Transport Capacity (R)
- Overall Moisture Management Capacity (OMMC)

Item No.19

Rota Dyer (3 Nos.)

Specifications:

To carry out exhaust dyeing of Textile substrates working temperature upto 135 degree celcius

- Having 18 beakers of 200ml capacity each
- Forward & reverse carriage rotation at 25 RPM speed
- Automatic controller having program memory and each program of multiple steps and LCD display showing at a glance gradient hold time & temperature with service free controller.
- Machine tank, beaker stand, carriage & base frame should be of SS 304 materials.
- Beaker of SS 316 with electro polish
- Threaded beakers caps.

Item No.20

UV- Vis Spectrophotometer

Specifications:

True Double beam spectrophotometer with following specification and system should be used as standalone as well as PC based as per user requirement.

Supplier should declare original manufacturer details. Manufacturer should be authentic and has more than 15 years of operation in manufacturing UV-Vis spectrophotometer.

System should have in built S/W for DNA/RNA, protein quantitation program and can be used in standalone mode. Instrument should have high end optics design like Echell or Blazed holographic design and mountings of Elbert Fastie/ Czerny turner, ensuring high performance and high throughput results.

Operation: Instrument with capabilities like multi wavelength photometric, spectrum, time scan, kinetics, multi component quantitation.

Hardware:

Range: 195nm to 10500nm

Monochromator: Blazed holographic grating or Echell

Optics design Czerny Turner or Elber Fastie mountings.

Spectral Bandwidth: 1 nm or 0.5 nm

Wavelength accuracy: +/-0.3nm over entire range

Wavelength repeatability: +/- 0.1nm or better

Light source: Deuterium and Tungsten OR Xenon lamp.

Lamp Changeover: Automatic and user selectable lamp changeover between UV to visible Range.

Stray Light: Less than 0.02% or better

Photometric accuracy: Minimum +/-0.002 Abs or better

Photometric repeatability: +/-0.001Abs or better

Baseline Stability: Less than 0.0005 Abs/hr.

Baseline Flatness: Less than +/-0.001 Abs.

Noise level: Less than 0.0001Abs or better.

Detector: PMT or dual Silicon Photodiode.

Validation: Instrument should have in built validation tests.

Maintenance: Instrument should have in built maintenance program.

Software:

System should be supplied along with License S/W to be used in PC

DNA and Protein quantitation calculations should be done by instrument automatically.

Software should able to perform spectrum, kinetics and quantitation with normalization, peak pick, point peak, area calculation, derivatives, smoothing, log, Abs to %T, averaging, interpolation, data set and constant arithmetic, multiple factors and user design equation, display of standard and sample table simultaneously with calibration and sample curve.

Software should be GLM and GMP compliant with multilevel security and history.

Software should have user design report formatting with various type of pre defined formatting included including multi page layout.

Instrument should have more than 4 USB ports for interfacing various peripherals and facility for data to be taken in pen drive from instrument

Accessories:

1) Standard 10 mm curvets – 1 pair should be quoted along with instruments.

PC/ printer to be quoted separately.

Item No. 21

Fermentor

Specification:

Culture Vessel capacity 5L

Impeller 6-blade disk impeller and 3-blade pitched impeller

Sensors pH sensor, DO sensor, Temperature Sensor,

Anti-foam sensor

Agitation RPM 20 – 8000

Aeration units Control may be manual / Automatic

Exhaust cooler Yes

Heating blanket Yes

Local control system Windows software based

Item No. 22

Attachments for existing Image Analyzer

Specifications:

Pol Microscope XY stage Attachment

XY Stage Attachment for Object Guide without Point Counting to be mounted on the Polarising Microscope rotatable Stage.

Fine xy-control, suitable for different slide formats, Thin sections and cover slipped materials

Digital firewire Camera system for High Resolution-3.0Mpixels with a provision for software interpolation, 2/3" camera for low light imaging.

Progressive scan CMOS CCD with 6.55 x 4.92mm Size

Automatic Image Analysis Software with Detection & Counting features to measure size, shape, position, orientation, intensity parameters for multiple Individual features or particles. Software must have a capacity to provide the range of grey image processing methods to enhance image prior to analysis.

The Software should Perform threshold detection on colour & monochrome images, allow the user to modify, add, delete selected features by manual image editing feature, capability of measurement filtering to classify features for measurement, creates histograms to display the distribution of sizes and shapes,

Facility of Exporting data to Excel file to create user defined reports Analyses,

Live Measurement Software (without capturing an image)

To do the measurements by manually drawing on live image.

Types of Measurements - Linear distance, Curved length, Area, Angle, Count.

Multiple line measurements for distance from a defined baseline

Multi Focus Imaging Software for uneven Surface imaging for Multi layer imaging

To perform Simplified operations by automatically adjusting step size and the number of images to microscope magnification, aperture and camera resolution, Should provide an intuitive interface and easy operation by automatically optimizing the Z step size and number of images based on the aperture and the camera resolution.

Item No. 23

Anaerobic Workstation for cultivation of Anaerobes (1 No)

Technical Specification:

1. Material of construction should be Durable, Non Corrosive Acrylic Resin Sheet construction renders better visibility and insulation
2. Dimensions should equal to or greater than
External: 1150 X 740 X 820
Main Chamber: 800 X 560 X 700
Inter lock: 350 X 450 X 500
3. Interior Volume: 500 L.
4. Plate Capacity: 800 plates of 90 mm x 15mm
5. Workstation Capacity
 - a) Minimum 500 plates of 90mm X 15mm
 - b) Additional inoculation space for regular working.
 - c) One power supply ports inside the chamber.
6. Inter lock Capacity:
Minimum 100 plates of 90mm X 15mm
Auto Inter lock cycle.
7. Incubator :
 - a) Minimum 80 plates of 90mm X 15mm
 - b) Four separate shelf with individual door.
 - c) Individual controlled temperature.
8. Digital Oxygen Display within the chamber.
9. UV Light provision inside the main chamber.
10. Two Nozzles ports for utility connection.
11. Air recirculation through HEPA filter.
12. Bare Hand facility for easy movement inside the main chamber.
13. To continuously monitor positive pressure inside the chamber.
14. Electrical Loop sterilizer facility inside the main chamber.
15. Safety Exhaust pressure relief valve.
16. Auto Condensate controller.
17. Auto excess pressure control system.
18. The front 10% slope viewing panel.
19. To continuously monitor positive pressure inside the chamber.
20. Temperature ambient to 50 deg C.
21. Temperature Controlled with Display.
22. Humidity controlled with display.

23. Proper valve for purging, both for main chamber & Interlock chamber.
24. Vacuum Pump: Oil free, noiseless.
25. Auto controlled cycle and Foot switch should be present.
26. Foot switch for purging & Vacuum of gases.
27. Premixed anaerobic gas.
28. Catalyst and Detox.
29. Catalyst for O₂ frees Atmosphere.
30. Activated Detox to absorb smell.
31. Heater for dehumidification.
32. Control Panel with Indicator.
33. Low gas alarm with indicator.
34. Inspection Spot-lamp.
35. Accessories with system
 - Mix gas cylinder - A Grade, 47 Lit water Capacity.
 - Nitrogen gas cylinder - A Grade, 47 Lit water Capacity.
 - Regulators 2 Set
 - Pair of gloves
 - Pair of O- ring for gloves
 - Additional Palladium Catalyst and Detox sachet
 - Trolley to keep Anaerobic Workstation.
 - Anaerobic indicator strips.
 - Petri dish stand holder.
36. Warranty for Three years
37. ISO, CE Certification is Desired

Item No. 24

Centrifugation based Protein Characterization System with built in Scanning UV/VISIBLE and integrated Rayleigh Interference optics, operating at 220-240 volt, 50Hz

Specifications:

Air-cooled drive requires with no chlorofluorocarbon
Thermo-electric cooled chamber, should not require Chlorofluorocarbons
Maximum heat output of 3412 BTU/hour
Infrared radiometric control system accurate to +/- 0.5oC
Speed control +/- 20 rpm
Temperature control range of _0-40~DC

Should include following two rotors:

1. 8-Place rotor, 50,000 rpm , 201600 x g with Cells & windows
2. 4- Place Rotor 60,000 rpm ,2,90,000 x g

Optical System Specifications:

1. Scanning UV/VISIBLE detection systems:
 - Operating in wavelength or radial scanning mode
 - 190 - 800nm wavelength range
 - 0 to 3 A photometric display range
 - Minimum radial increment 0.001cm
 - Minimum wavelength increment 1nm
 - Maximum of 1000 data points per scan
 - Approximately 1 absorption reading every 20 milliseconds
 - 1 to 100 replicates per data point

2.Rayleigh Interference

- Wavelength, 660 nm
- CCD Camera Resolution, 2048 x 96 pixels
- Laser, 30 mW Diode
- Scan Rate, approximately every 5 seconds
- Interferometer precision, approximately +/- 0.003 fringe

PC Controller & Data Analysis

The system should be controlled by a latest windows based software package that allows users to set parameters, initiate a run and collect data.

Comprehensive Data Analysis Software Package with scripts for equilibrium and velocity analyses
Defined graphical and numerical output, easily customized by user
Calculated parameters include equilibrium ,association constants (Ka), solution molecular weights, sedimentation and diffusion coefficients .

PC System Controller

Latest Window based user interface with status window showing current run conditions, System diagnostics, data storage in ASCII format, Graphic display of data, Capable of creating user-specified data, subset automatically labeled with user-entered sample information and, system-generated run information

Should be able to perform following applications:

1. Detect, measure, record and analyze the movement of molecules in solution under influence of centrifugal field.
2. in-solution characterization of proteins, oligomers, aggregates, particles, colloids, small & Nano structures
3. Sedimentation Velocity & Equilibrium studies

The System should be designed, tested and found to comply with all major national and international product safety and EMC standards and regulations.

Accessories to be provided

Experimentation Cells: The system should be provided with at least 14 complete sedimentation velocity cell assemblies fitted with sapphire windows and at least 7 sedimentation equilibrium cell assemblies fitted with sapphire windows. It is assumed that 1 box each of spare gaskets, screws and other accessories needed to assemble cell will be provided.

Torque wrench and cell assembly press.

The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.

Item No. 25

CONFOCAL LASER SCANNING MICROSCOPE SYSTEM WITH LIVE CELL IMAGING CAPABILITY

Specifications:

The confocal microscope system should be of latest and modular technology suitable for biological applications. The confocal system should be capable of high sensitivity detection mechanism meeting various applications of Biological samples.

The system should be offered with the following configuration:

1. Motorized inverted microscope for Bright field, DIC & Fluorescence
2. Motorized Z-focus drive with minimum z-step resolution of 15-20 nm or better with dedicated TFT/LCD screen for the control of motorized functions of microscope.
3. 6 position motorized Fluorescence filter wheel & 6 position motorized nosepiece
4. Mechanical X-Y specimen stage with universal sample holder
5. 12V /100w halogen illumination for transmitted light and high power. Metal Halide/ Mercury Arc lamp illumination for Fluorescence with lamp life minimum 2000 Hrs.
6. Confocal Grade Plan Apochromatic Objectives 10x, 20x, 40x, 60/63x/1.40 & 100X 1.40 oil
7. Fluorescence filters for UV, Blue & Green excitation or DAPI, FITC/GFP & TRITC/Rhodamine
8. The system should be offered with the following laser lines to excite the respective fluorophores.
 - A. 458/488/514nm with Ar laser min 35 mW.
 - B. 561 nm laser.
 - C. 633 nm laser.
 - D. 405 nm laser.

The system should be upgradable to additional lasers.

9. Visible Laser Set with AOTF containing the laser lines
10. Scan head should have at least 3 independent filter-free inbuilt spectral detectors with independent voltage and offset control. One of the detectors should be High sensitive detector (for spectral imaging)

11. All the Fluorescence detectors of the scan head should be filter free with freely selectable emission band width detection capability to suit to the emission spectra of the dyes.
12. The spectral dispersion of the emission light should be based on either reflection grating with enhanced/improved spectral signal collection device or with prism based spectral dispersion with high efficiency.
13. The system should be capable of recording emission spectra with minimum spectral resolution of 5nm or better.
14. Computer controlled continuously variable confocal pinhole with software control.
15. Maximum scan resolution should be at least 5-6Kx5-6K pixels for all channels and higher will be preferred.
16. The scan field diagonal should be at least 20 mm F.O.V. higher will be preferred
17. Scan Zoom range 1:40x or 1:48x or more and should be adjustable in steps of 0.1. Higher Zoom range is preferred.
18. System should be capable of acquiring minimum 6-8 frames per second @ 512x512 pixel resolution and should increase with ROI and zoom selection. Digitization capability of 8/12/16 bit should be available with the system.
19. An additional transmitted light detector should be offered for bright field and DIC imaging
20. Latest control computer with Software capable of controlling Motorized functions of microscope, digital camera, scan head control, laser control including AOTF and Image acquisition & processing. It should have Windows -7/Mac operating system, 800-1000 GB HDD, 6 GB RAM, NVIDIA Quadro 600 1GB high performance GPU or equivalent, DVD Drive with 28-35" one monitor/ 18-24" two monitors with high resolution setting.
21. Basic software for microscope control, Confocal system control, with basic modules for ROI scan and bleach for FRAP, 3D imaging and reconstruction, time-lapse etc.
22. Dedicated confocal 3D visualization software module to immediately open the multidimensional images like multichannel Z stack with time series.
23. It should be able to play the time series volume as 3D time series movie.
24. It should allow to record the 3D animation with various adjustment like pseudo coloring, intensity, rotation, clipping, 3D enhancement etc., Various 3D projection modes: Transparent, Maximum Intensity, and Depth coding, Stereo images (cyan / magenta, horizontal and vertical shutter, quad- based)
25. Advanced and dedicated FRET AB, FRET SE, FRAP, and FAST FRAP software. FRET & FRAP Analysis software

26. Anti Vibration Table compressed air damping and a computer table should be supplied along with confocal system by the same manufacturer of Confocal will be preferred.
27. One offline analysis software should be offered.
28. Monochrome cooled CCD Camera with 6.45X 6.45 microns pixel size ,It should be 1.4MP. It should be controlled with same confocal software for high resolution fluorescence imaging.
29. An on stage environmental control chamber (incubator) for long term live cell time lapse imaging with temperature, CO₂ and Humidity control. The system should be able to use 100% CO₂ gas supply and to provide 5% CO₂ gas to the chamber.
30. 6KVA online UPS with minimum 30 min back-up.
31. The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.

Item No. 26

Fluorescence activated cell sorter (FACS)

Specifications:

- With four lasers i.e. 488 nm; 633 nm; 561 nm and 375nm; upgradable to six lasers,
- Tunable for measurement of 15 parameters with upgradation to 20 or more florescent parameters; fixed optical assembly of laser;
- able to analyse cells at a rate minimum 70,000 cells/sec. or more;
- able to sort cells at a rate of up to 70,000 cells/sec. or more with a minimum purity of 98% regardless of the number of lasers or fluorescence parameters being used;
- Data Resolution of 4.5 decades or more is desired with high digital signal processing ability; fully programmable, software-controlled sample input
- station with provision to accommodate various tube formats with capacity of 0.5 ml, 1.5 ml, 5ml, 15 ml & 50 ml tubes respectively; automatic agitation & automatic back flush; have both 2-way & 4-way sorting capability;
- Multi-well sorting ability with flexibility to sort cells into 24 to 1000 well configurations and provision of single cell deposition on to slides or into wells; with multiple size nozzles for smooth analysis & sorting of different cell types; their
- removal and insertion should be without realigning the optics or fluidics of the instruments; able to perform at pressure rensing 5 to 90 PSI with proven capability of sorting various cells/cell lines like stem cells, T & B cell, somatic cells, fluorescent proteins & cancer cells etc. ;
- sample protection during sort interruption; able to alert the operator if sorting shuts down via either page, email or through audible alarm;
- Colour compensation of all possible spectral overlaps with feature of the auto compensation.
- Computer-controlled sample input Station
- Multiple nozzles
- Mac/Windows based acquisition & analysis software platform for on & offline use, import & export all standard FCS formats. Histograms, dot plots, & statistics easily imported into other applications, such as Microsoft Word, Excel & power point.

- Offline analysis at multiple sites. Provision for Autoclave-able sheath & waste tanks & replaceable sterile sample tubing is desired.
- The system software should be capable of establishing baseline settings of system performance.
- The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.
- Suitable online UPS with minimum 30 min back-up.

Item No. 27

Capillary DSC

Fully integrated liquid handling system includes:

- Complete precision XYZ robotic arm.
- Three thermostatically controlled drawers, each holding two 96-well microtiter plates.
- 10-port injection valve with minimal dead volume.
- Integrated wash station for rapid, high volume cleaning.
- Custom Injection syringe.

SCANNING TEMPERATURE RANGE: -100C to 130C

USER ADJUSTABLE SCAN PARAMETERS: Allows user to adjust scan parameters for all scans to be unique.

USER SELECTABLE SCAN RATES: Upscan: 0C/hr to +240C/hr

BASELINE REPRODUCIBILITY: For successive upscans at 200C/hr with 10 sec data point filter over a temperature range of 5C-110C the standard deviation between successive runs = 1.5 μ C/QC

MINIMAL SHORT TERM SIGNAL NOISE: (RMS Average) 0.6 μ C/QC – Using upscan mode at 200C/hr with 10 second filter from 5C to 110C.

FOUR USER SELECTABLE RESPONSE TIMES: Allows user to optimize sensitivity for the process being studied (patent # 5,967,659).

POWER FEEDBACK COMPENSATION: Heat compensation to cells via power feedback for accurate, sensitive heat determinations and rapid response.

ADIABATIC CHAMBER FOR SAMPLE AND REFERENCE CELLS: Cells enclosed in adiabatic chamber (impermeable to environment). Resulting baselines are much more reproducible and stable.

INTERNAL PELTIER DEVICE: Provides the most efficient, rapid and precise temperature equilibration between experiments. This cannot be achieved with an external water bath.

SAMPLE AND REFERENCE CELLS CONSTRUCTED OF ALLOY: ALLOY should be a non-reactive alloy that will not interact with biological materials. The 316L, helical-shaped capillary sample and reference cells are extremely resistant to strong acids. Material corrosion compatibility guide provided.

POSITIVE PRESSURIZING SYSTEM: External pressure source (not included with instrument) allows user to seal the reference and sample wells allowing user selectable positive pressures to be used during scans.

THERMOSTATED SAMPLE PREPARATION AND CLEANING DEVICE: Accessory included for thermostating and degassing samples. Can be configured to facilitate sample and reference cell cleaning. Temperature range 0 – 80QC; Vacuum of 28.4" Hg.

USER INTERFACE WITH AUTOSAMPLER SUPPORT: Proprietary software controls all real-time parameters of VP Capillary DSC. autosampler support functions including:

- Intuitive, graphical tray setup
- Syringe and cell maintenance controls
- Advanced Autosampler Configuration
- Methods Editor
- Automated calibration procedures and standardized calibration report generators

Fully integrated with Origin® data analysis software for post run analysis

PROPRIETARY SOFTWARE:

SOFTWARE INCLUDES:

--SIX USER SELECTABLE CURVE FITTING MODELS:

For data analysis. No filters are applied and user can review raw data. Real response time approximately four seconds. Publication quality graphics.

- Two-State
- Non Two-State
- Two-State with C_p
- Dissociation with C_p
- Simulation Model
- Binding Constant

Automated calibration procedures and standardized calibration report generators

The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.

Item No. 28

Gel Permeation Chromatography System

Specifications:

Main Instrument: Integrated GPC system (ambient to 80°C or better) Including Pump, degasser, autosampler, solvent and sample delivery system with RI Detector, high sensitivity Viscometer detector and light scattering detector. Conventional Calibration & universal Calibration and triple detection software.

Software: Full GPC software for multi detector system suitable for data collection, complete analysis of polymer properties, and report generation.

Detailed Specifications of each component are mentioned below: inferring

RI Detector Specifications:

Measuring principle - Deflection

Light Source - LED

Cell - 45° quartz glass, 12µL volume

Purging - 3 modes, Manual, Automatic and Programmable

Data rate - 100Hz collection

Light scattering detector:

Measuring principle - RALS, 90° angle; LALS, 7° angle, with high efficiency optics

Light Source - Temperature controlled laser diode, 10mW, 660nm

Cell - Ultra low volume 18µL; Data rate 100Hz collection, DSP with 5Hz to OmniSEC

Viscometer Detector Specifications:

Measuring principle - Inert, 4 capillary differential Wheatstone bridge configuration

Transducers - Digital Inert Transducer technology with over-pressure protection

Measuring volume - 18µL

Purging - 3 modes, Manual, Automatic and Programmable

Data rate - 100Hz collection, DSP with 5Hz to OmniSEC

UV-Photodiode Array Detector Specifications: [OPTIONAL]

Wavelength/resolution - 190 to 500nm or 430 to 710nm on 256 diode array

Light Source - Deuterium (190-500nm) or Tungsten (430-710nm)

Cell volume - 10 μ L; Data rate - 256 channels at 1Hz direct to OmniSEC

Degasser Specifications:

Channels/volume - Two channels, 8ml per channel; Performance - <0.5 ppm oxygen at 0.5 mL/min

Eluent Sensor - User selectable, stops GPC pump when eluent runs out

Pump Specifications:

Flow rate range - 0.01 to 9.99 mL/min

Pulsation - Less than 1% (measured with viscometer)

Pressure Reading - MPa or PSI; Soft start/stop - User programmable in mL/min/min

Autosampler:

Capacity (Standard) - 120 vials, freely programmable position sequence

Range - Variable injection volume, between 20 and 150 μ L; Reproducibility - Better than 0.5 %

Carryover - Less than 0.1%, depending on wash program

Interface

Acquisition - 6 channels, 5Hz, unlimited acquisition time

Calculation modules - Conventional, Universal, Light Scattering Triple, Copolymer, Protein specific, FIPA

Results output - Mn, Mw, Mz, Mp, Mw/Mn, IV [h], Rh, Rg, Branching Number, Branching Frequency, Number of Arms, Weight Fraction, Concentration, MH-a, MH-k, dn/dc, dA/dc. A2

Minimum PC specification- Windows XP or higher, 100 GB HD, 2GB RAM, 1.8 GHz processor, Graphics 1024x768, 16-bit colour depth

1) Both Viscosity detector's transducer MUST be equipped with DIGITAL acquisition technology for highest resolution and fastest data acquisition rate.

(2) The Viscometer must be equipped with Digital Pulsation Compensation technology for superior signal/noise.

(3) The Viscometer must possess over-pressure safety feature.

- (4) The GPC acquisition software MUST be able to monitor and acquire both Differential Pressure Transducer and Input Pressure Transducer signals for viscometer data integrity.
- (5) The GPC software must be able to acquire the UV absorption spectrum and be able to provide Copolymer Composition Analysis based on the spectrum data.
- (6) The GPC software must be able to provide plots of UV absorption/Wavelength/Molecular Weight for complete absorption fingerprinting of molecular weight profile.
- (7) The GPC software must be able to control the GPC system parameters, monitor detector signals, acquire data and provide analysis within ONE software module.
- (8) The GPC system must be equipped with no less than 6 A/D channels for detector signal inputs.

The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.

Item No. 29

Solar Simulator

Specifications:

Items		Description
1.	Cell Tester –Solar Simulator and Model CC-3, a three (3) Amps capability I-V measurement, and, a NREL-Based Calibrated Reference Cell.	Cables, Operating Manual, & two (2) years warranty
2		Measurement equipment to test sequentially on Confirmation of AAA conditions by the user <ul style="list-style-type: none">• Temporal stability testing• Uniformity testing
3		MEASUREMENT SYSTEMS Technical Specification Max. current range(A) ± 1 Max voltage Range (V) ± 200 Max.power (W) 20 Measurement Resolution: 16 bit Measurement Accuracy: Better than 0.5% Measurement Mode: Fixed or Auto Measurement Time (Light): <500ms for stable light (Up to 4s filtering for light fluctuations required) Measurement Time (Dark): 100-1,000 ms Maximum Point per Curve: 4,096 Maximum Data Acquisition Speed: 100Hz Maximum Cell Throughput: 1,200/Hour (With Optional Robotics) Phase (Power): Single Phase

		<p>Voltage (Volts) / Frequency (Hz): 220VAC (115VAC Optional)/50-60Hz</p> <p>Maximum Power Consumption (W): 40 W (Up to 600W With Pettier Celle)</p> <p>Curve Correction to STC: IEC 80891, JRC or Anderson</p> <p>Advance Fitting of I-V Curves: SEM, DEM and VDEM Models (17 Different Weight Functions)</p> <p>Thermal Coefficients of Voc and Pm: Standard on All Systems (With Optional Temperature Control)</p> <p>Irradiance Monitoring & Correction: Standard on All Systems</p> <p>Measure & Record Cell Temperature</p> <p>Measure & Record Light Intensity</p> <p>Calculation of Series Resistance as per IEC 60891</p> <p>Curve Fitting to Equivalent Diode Models</p> <p>Weight Functions for Curve Fitting</p> <p>Curve Correction to STC or User defined Conditions</p> <p>Derive Thermal Coefficients of Isc, Voc, Im, Vm, Pm, FF, Rs@Voc, Rsh@Isc</p> <p>Virtual or Actual Cell Sorting (Binning)</p> <p>Software includes advance fitting programs</p>
4		Temperature Control Peltier cooling/heating 5 to 65degC
		Needle type Contacts for Thin film and organic samples
		<p>Semiprobe, Vermont ,USA</p> <p>Manipulator is intended for precise probing and instrumentation for industrial, medical, biological, semiconductor, and general scientific applications. It provides 3-axis motion with .500" movement on each axis. Motion is controlled by three 80 TPI adjustment screws. (40 and 100 TPI also available on special order). Precision high-quality 440 stainless steel ball bearings allow precise linear motion on all three axis. Gibs and Slides are made of heat treated 440 stainless steel with ground finish.</p> <p>Specifications:</p> <p>Height: 4.00" Nominal</p> <p>Travel: X, Y, Z axis = .500"</p> <p>Dimensions: (H,W,L) (3.25" x 2.00" x 2.50")</p> <p>Resolution: 40 TPI (80 TPI, and 100 TPI available on special order)</p> <p>Magnetic Base for Semiprobe manipulator with switch to turn magnetics on</p>

		<p>and off. The switch may be positioned in between to provide some resistance to motion for fine positioning.</p> <p>Face Plate for multiposition mounting of Coaxial or Triaxial Probe Arms for SemiProbe Manipulators</p> <p>A-ARM-CA-9051 Coaxial Probe Arms for SemiProbe Manipulators Material: nickel plated brass Cable length: 2' (60cm) Cable type: CoaxConnector: BNC Arm Reach: 12 cm May be cut down for short reach applications Needle holder: 3 position collet (0, 30, 45 degree needle angle) Lens viewing for positioning & monitoring the contacts</p>
		Needle type Contacts for Thin film and organic samples
		<p>9:1 motion ratio and a scan area of 0.10" x 0.180". It is available with or without the removable extension rod. The body is made of mold injected Delrin and it is mounted onto a strong magnetic metal base. The <i>JoystickMicropositioner</i> is capable of rapidly establishing contact with probing targets as small as 1 mil. The small size and simple design make it easy to place multiple probes down on one device when platen space is limited. A large X-Y scanning area is augmented by the adjustable "Z" movement of the probe. The spring probe clamp is electrically isolated from the positioner body, and is connected to an 18" wire termination with a male pin jack connector installed.</p> <ul style="list-style-type: none"> • Shaft Probe(10 nos.) Shaft Size: 20 mil <p>Material: Tungsten carbide for low leakage current</p> <p>Taper Length: J</p> <p>Taper profile: 3</p> <p>Radius: 12.5 um</p>
6		NREL-Traceable Calibrated Reference cell.
7	Computer	Suitable Computer & UPS

The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.

Item No. 30

Fuel Cell Test Station Specifications:

<p>Specifications: Electronic Load: Maximum Load Current: 150A Maximum Load Power: 250W Maximum Load Resistance: 0.7mΩ (0.1V at 150A) Current Measurement accuracy: 0.5% F.S.R Current Resolution: 11mA Potential Measurement. Maximum Voltage: 5V Potential Measurement accuracy : < 0.1% F.S.R Potential Resolution: 76μV Impedance: Frequency range: 10μHz-10KHz (accuracy 1%, 1.) Amplitude (Programmable) Potentio: 1mV-1V Galvano: 150mA- 75A Data Acquisition: 10,000 samples/sec Communication: Ethernet 10/100baseT Temperature Controller: 5 Heater P.I.D Controllers. One for Cell 2 for Heaters 2 for Humidifiers 46,000.00 1 46,000.00</p> <p>Probe: PT100 Software Limit: 120.C Reactant Gas control system: Humidifiers: Designed with Bypass Temperature: ambient to 120.C 100%saturation at 87.C from ambient to 4 Bars for Input gas flow of 5 L/min. 1.8 L Water Bottles/Max Fill capacity0.6L Heated Reacted Delivery line: 870W Mass Flow Controller (Automatic) H2: 0-120 l/h O2: 0-300 l/h Double calibration for O2 and Air. Back Pressure control: 0-5 Bars Manual. Internal alarm on temperatures and pressures. External alarm input.</p>	<p>Transfer Gas line Heaters Max Temperature: 120.C Software Features. Gas control and Display: Temperatures, Pressures, flows. Independent for each cell and each Gas. Facilities: Current Density Display On the fly Parameter Modification. Multi variable Graphic display. Load Control: Galvanostatic/Galvanodynamic Potentiostatic/Potentiodynamic Power/Load</p> <p>Software Techniques: Open Circuit Voltage Voltage Pulse Current Pulse Voltage Scan Current Scan Potentio EIS Galvano EIS Constant Load Discharge Constant Power Discharge Loop. General: Dimensions:495*430*470mm Weight:50kg Power:85-264V,47-440Hz PC Configuration: Pentium IV, Windows 2000,Xp or Vista</p> <p>All optional accessories must be quoted separately.</p> <p>The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.</p>
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Item No. 31

GC-MS System

Specifications:

Vendor is requested to quote separately for each module Mass Spectrometer

Sr.No.	Parameter	Desired
1	The mass spectrometer	should be Quadrupoleiontrap / Quadrupole Transmission analyzer
2	The mass range	1 – 1000 daltons (amu)
3	Resolution	The resolution should be unit mass over the entire range.
4	The mass axis stability	±0.1 amu over 72 hrs or better
5	Dual filament	The MS should have a dual filament assembly in both EI & CI modes.
6	The maximum scan rate	10000 amu/sec or better
7	The transfer line	Should be independently heated up to 350°C
8	The manifold	Should be independently heated up to 120°C
9	The analyzer temperature	Should be independently heated up to 250 °C
10	The electrode surface of the analyzer	The electrode surface of the analyzer should have protective coating for maximum inertness. *indicate coating
11	The MS analyzer	The MS analyzer should be capable of doing MS/MS and MS ⁿ
12	Ionization modes	The MS should have EI and CI ionization modes
13	Capability of MS	The MS should be capable of doing EI/MS,CI/MS,EI/MS/MS, CI/MS/MS in a single analysis run without changing any hardware.
14	Capability of MS-MS	The MS system should be capable of doing automated method development for MS/MS analysis.

15	Capability of MS	The MS should be capable to do SRM (Single Reaction Monitoring) and MRM (Multiple reaction Monitoring) analysis.
16	Capability of MS	The MS should have capability to do low pressure liquid chemical ionization with automatic control of CI reagent (liquids)
17	The linear dynamic range	10 ⁴ or higher
18	Special Injector	The system should have a solid probe facility in the programmable temperature and flow in injector(PTV) to introduce solids, slurries and liquid samples in a disposable micro-vial without breaking vacuum.
19	MS analyzer	The MS analyzer must have pre-aligned electron multiplier detector which can be replaced without using any hand tools.
20	Turbo molecular pump	280L /sec turbo molecular pump or better.
21	Foreline pump	Pumping speed greater than 95L/min dry pump preferred
22	NIST and WILEY Library	The system should be supplied with NIST and WILEY Library
23	The MS system should have a performance criteria of	a)In EI Mode 200 fg of octafluoronaphthalene at a S/N of 20:1 RMS or better b) In CI Mode 5 pg of Benzophenone at a S/N of 50:1 or better

Specs for GC

- 1) The GC should be capable of having two injectors
- 2) The GC should have the capability to support two or more conventional detectors
- 3) The GC to have a provision of back flushing the column and carrier makeup gas.

4) The GC to have two optional auxiliary heater temperature sensor and control facility for future upgradability.

5) The column oven should have following features

Oven Volume : 15 litres

Temperature range should be from ambient RT °C to 450 °C

Temperature program ramps/holds: 24/25

Maximum temperature ramp rate: 120 °C/min for all voltages

Cool down rate: 400 °C to 50 °C in less than five minutes

Temperature set-point resolution: 1 °C

4) The programmable temperature vaporizing injector should have following capabilities

Pressure range: 0-150 psi

Temperature range: RT to 450 °C

Maximum temperature ramp rate: 180 °C/min

Temperature ramps: 4

Split range: 1:1 to 10,000:1

Operational modes

- Temperature ramped splitless
- Cold on-column
- Large Volume Injection (LVI)
- Split and splitless

5) OPTIONAL Auto Samplers should have following capabilities

- Auto liquid sampler for GC with minimum 80 vials tray for 2 ml vial
- Simultaneous injection capability on dual injectors in single run
- User definable three different solvent wash combinations
- User definable air gap facility, solvent plug capability in auto sampler
- User definable minimum plunger fill speed capability of 5.0ul /sec

- User definable plunger inject speed capability
- Pre and post injection delay capability
- Internal std addition capability
- Viscosity delay capability

6) Vendor is requested to provide:-

- a) Calibration standards up to 1000 daltons, for GC-MS
- b) Calibration standards for the GC
- c) Low bleed GC capillary columns compatible to BPX1, BPX5, BPX20, BPX70, O.D.:- 320 Micron, Film Thickness:- 5micron, , Blank Capillaries, Siltight unions with vespel ferrules, Vendor is requested to discuss before the Quote.
- d) Gas cylinders for He, CI gases and two stage regulator from BOC
- e) Spare filaments, nuts, Vespel Ferrules, vespel blind, unions, selenised glass wool, low bleed septums, etc
- f) EI, CI rebuild kit for five years
- g) EI, CI maintenance kit including polishing abrasives
- h) Tool Kit
- i) Spare for vacuum system, consumables and rebuild kit, 'O'rings retainer rings clamps etc.
- j) Exhaust hose etc
- k) Spare Vent Valve
- l) It is desired to vent the system with the dry nitrogen gas. Suitable provision may be made.
- m) Supply of large capacity carrier dryer and De-Oxo Trapping cartridges are to be provided with the one spare pack.
- n) Zero dead volume 1 micro liter syringe with cone type needles five in number are to be supplied with system with the spare exchange able needle and pistons
- o) Two sets of service tools including capillary cutters, ferrule extraction and deburring tool is to be provided with the system.

The work station:-

If the equipment is imported requires PC, printer other peripherals, they can be bought from India and should be of International brand such as HP, DELL The monitor should LED-LCD / TFT screen. The printer should be LaserJet printer. The processor should be latest of Intel Quad Core, Intel i7 or AMD Quad., N-vidia G-force 2GB VRAM, Graphics card or better.

The PC or Work Station to have a bundled software package of Windows-8 OS, MS Office 2010 or latest., DVD writing software and diagnostic utilities

The two sets of operating manuals, service manuals soft and hard copy and new user training material in PPT is to be supplied

Item No. 32

Imaging Flowcytometer

Specifications:

- The system should be able to capture images of the cells in flow and to provide quantitative information like Dot plots, histograms along with objective image analysis, and statistical data for large cell populations.
- The system should be upgradable upto 7 lasers. All laser should be specified and quoted separately in the quote.
- The software of the system should be able to calculate several features per cell with readymade “wizards (Guided analysis)” for applications such as apoptosis, cell cycle-mitosis, co-localization, internalization, nuclear localization, shape change etc.
- The system should be capable of doing studies like cell Cycle analysis, Immunophenotyping, Intracellular cytokines estimation, Co-localization, Internalization, Morphology analysis etc.
- The system should have a dedicated 785nm laser for SSC detection.
- The system should be compatible with a wide variety of flow dyes like FITC, GFP, PE, PI, PE-Cy5.5, PE-Cy7, APC, APC-7, DAPI, Pacific Orange, Qdot-605, Nile Blue, APCCy7 etc.
- The system should have CCD detectors with a total of 6 channels as standard and the option to be upgradable up to 12 channels for parameters including brightfield, darkfield (SSC) and upto 10 fluorescence markers.
- The system should have a sensitivity of less than 50 MESF.
- The system should be capable of using 1.5-2 ml micro centrifuge tubes for sample acquisition.
- The system should have a feature of auto-compensation.
- The system should have the speed of 1000 cells/ sec.
- The system should have an objective with magnification of 20, 40 and 60X.
- The system should have Time delay integration (TDI) CCD camera to greatly increase the sensitivity, even at very high imaging rates.
- The system should be capable of performing quantitative image analysis for various applications including Shape change, Nuclear Translocation, Internalization, Apoptosis etc
- The system should allow seeing corresponding cell imagery by clicking over dot in a plot.
- The system should have automated instrument start up, cleaning and shut down procedures.

The quote should include Minimum 3 year of warranty and at least 5 years of annual maintenance contract along beyond the warranty period.

Item No. 33

Subcritical water/ Supercritical CO₂ Extraction equipment

Specifications:

1] Modifier HPLC Pump

- Dual piston with gear driven pump for smooth and precise flow rate.
- Flow rate precision : +/-0.1%
- Pressure range : Up to 6500 PSI (up to 50Mpa)
- Flow rate : 0.001ml to 10ml/min
- Constant Flow/Constant Pressure
- Flow Rate Accuracy : +/- 1.0 %
- Time Programming facility.
- Automatic plunger cleaning.
- Built-in solvent selection knob.

2] CO₂ CO₂ Delivery Pump

- Type of pump : SSQD method
- (Slow Suctino Quick Delivery)
- Flow rate setting : 0.001~10 mL/min
- Flow rate range : 0.2~7 mL/min
- Pressure range : 0~30 MPa
- Max. pressure : 0~35 MPa
- Time programming : Flow rate, Upper pressure limit,
- Lower pressure limit, solvent
- switching
- Materials : All materilas in contact with solvent
- are sapphire, ceramic, stainless steel
- fluorocarbon polymer, PEEK
- Cooling method : Peltier built-in
- Dimension : 225(W)x430(D)x315(H) mm
- Weight Approx. 22 kg
- Power input voltage : AC 100~240V, 50/60Hz
- Power consumption : 500VA

3] Tubing kit for CO₂ cylinder to pump

4] stop valve

5] Automatic Back Pressure Regulator

- Pressure control method : Open/close control by variable stroke needle valve
- Pressure setting range : 0.0 ~ 50.0 MPa with 0.1 MPa increment
- Operating pressure range : 1.0 ~ 50.0 MPa
- Pressure control precision : $\pm 2\%$ of the setting value or ± 0.2 MPa, whichever is larger (Condition: at flow rate of 5 mL/min as carbon dioxide)
- Operating flow rate range : 0.1 ~ 150 mL/min
- Fluid temperature : 0 ~ 60°C
- Temperature setting range (Heater) : 30°C ~ 80°C Temperature control range : room temperature 10°C~ 80°C
- Materials in contact with Fluid : stainless steel, fluoropolymer, PEEK
- Time Program: : Number of the files: 5
- Number of the file steps: 64
- Time: max 999 min
- Programable parameters : Pressure and temperature

6] Stainless tube 1/16", 0.5mm ID x 10m

7] Compression screw (short) 1/16 for single ferrule Single ferrule (short) 1/16",

8] High Pressure Dynamic Mixer / Accumulator

9] High pressure 6-way valve

10] Rheodyne 7725i Injector

11] EV-3 extraction vessel 50 ml For solid and liquid samples

12] extraction vessel

13] Maintenance tool kit-

14] 3 Way joint 1/16" short

15] Local Column Oven (upto 250Deg C) -1 No.

16 Restrictor valve - 1 No.

17] Rack for test tube

18] Branded high end computer

System should be fully automatic. Pls. also quote for branded high end computer. .

Pls. note that a single unit should take care for both system i.e subcritical water extraction and supercritical CO2 extraction.

Item No. 34

Specifications for GC-MS

Vendor is requested to quote separately for each module

Mass Spectrometer

Sr.No.	Parameter	Desired
1	The mass spectrometer	should be Quadrupole iontrap / Quadrupole Transmission analyzer
2	The mass range	1 – 1000 daltons (amu)
3	Resolution	The resolution should be unit mass over the entire range.
4	The mass axis stability	± 0.1 amu over 72 hrs or better
5	Dual filament	The MS should have a dual filament assembly in both EI & CI modes.
6	The maximum scan rate	10000 amu/sec or better
7	The transfer line	Should be independently heated up to 350°C
8	The manifold	Should be independently heated up to 120°C
9	The analyzer temperature	Should be independently heated up to 250 °C
10	The electrode surface of the analyzer	The electrode surface of the analyzer should have protective coating for maximum inertness. *indicate coating
11	The MS analyzer	The MS analyzer should be capable of doing MS/MS and MS ⁿ

12	Ionization modes	The MS should have EI and CI ionization modes
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15	Capability of MS	The MS should be capable to do SRM (Single Reaction Monitoring) and MRM (Multiple reaction Monitoring) analysis.
16	Capability of MS	The MS should have capability to do low pressure liquid chemical ionization with automatic control of CI reagent (liquids)
17	The linear dynamic range	10 ⁴ or higher
18	Special Injector	The system should have a solid probe facility in the programmable temperature and flow in injector(PTV) to introduce solids, slurries and liquid samples in a disposable micro-vial without breaking vacuum.
19	MS analyzer	The MS analyzer must have pre-aligned electron multiplier detector which can be replaced without using any hand tools.
20	Turbo molecular pump	280L /sec turbo molecular pump or better.
21	Foreline pump	Pumping speed greater than 95L/min dry pump preferred
22	NIST and WILEY Library	The system should be supplied with NIST and WILEY Library

23	The MS system should have a performance criteria of	a) In EI Mode 200 fg of octafluoronaphthalene at a S/N of 20:1 RMS or better b) In CI Mode 5 pg of Benzophenone at a S/N of 50:1 or better
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Specs for GC

- 6) The GC should be capable of having two injectors
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- 8) The GC to have a provision of back flushing the column and carrier makeup gas.
- 9) The GC to have two optional auxiliary heater temperature sensor and control facility for future upgradability.

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Temperature program ramps/holds: 24/25

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Temperature set-point resolution: 1 °C

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Pressure range: 0-150 psi

Temperature range

- RT to 450 °C

Maximum temperature ramp rate: 180 °C/min

Temperature ramps: 4

Split range: 1:1 to 10,000:1

Operational modes

- Temperature ramped split less
- Cold on-column
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5) OPTIONAL Auto Samplers should have following capabilities

- Auto liquid sampler for GC with minimum 80 vials tray for 2 ml vial
- Simultaneous injection capability on dual injectors in single run
- User definable three different solvent wash combinations
- User definable air gap facility, solvent plug capability in auto sampler
- User definable minimum plunger fill speed capability of 5.0ul /sec
- User definable plunger inject speed capability
- Pre and post injection delay capability
- Internal std addition capability
- Viscosity delay capability

7) Vendor is requested to provide:-

- p) Calibration standards up to 1000 daltons, for GC-MS
- q) Calibration standards for the GC
- r) Low bleed GC capillary columns compatible to BPX1, BPX5, BPX20, BPX70, O.D.:- 320 Micron, Film Thickness:- 5micron, , Blank Capillaries, Siltight unions with vespel ferrules, Vendor is requested to discuss before the Quote.
- s) Gas cylinders for He, CI gases and two stage regulator from BOC
- t) Spare filaments, nuts, Vespel Ferrules, vespel blind, unions, selenised glass wool, low bleed septums, etc
- u) EI, CI rebuild kit for five years
- v) EI, CI maintenance kit including polishing abrasives
- w) Tool Kit
- x) Spare for vacuum system, consumables and rebuild kit, 'O'rings retainer rings clamps etc.
- y) Exhaust hose etc
- z) Spare Vent Valve
- aa) It is desired to vent the system with the dry nitrogen gas. Suitable provision may be made.

- bb) Supply of large capacity carrier dryer and De-Oxo Trapping cartridges are to be provided with the one spare pack.
- cc) Zero dead volume 1 micro liter syringe with cone type needles five in number are to be supplied with system with the spare exchange able needle and pistons
- dd) Two sets of service tools including capillary cutters, ferrule extraction and deburring tool is to be provided with the system.

The work station:-

If the equipment is imported requires PC, printer other peripherals, they can be bought from India and should be of International brand such as HP, DELL The monitor should LED-LCD / TFT screen. The printer should be LaserJet printer. The processor should be latest of Intel Quad Core, Intel i7 or AMD Quad., N-vidia G-force 2GB VRAM, Graphics card or better.

The PC or Work Station to have a bundled software package of Windows-8 OS, MS Office 2010 or latest., DVD writing software and diagnostic utilities.

The two sets of operating manuals, service manuals soft and hard copy and new user training material in PPT is to be supplied.

Item No. 35

Fermentor (1 set)

Autoclavable Jacketed Fermentor (5 lit)

Specifications:

1. Jacketed autoclavable vessel for 5 Litre fermentor
2. Speed range 20–1500 rpm
3. The Fermentor's control system (module) should have integrated amplifiers for parameters like DO, pH, Foam, Level and Temperature and provisions for integration of Turbidity Amplifier
4. DO, pH probes, sparger system etc.
5. The fermentor should have 4 integrated peristaltic pumps and provision for connecting 2 external peristaltic pumps
6. The control system should provide set point profiles for 2 external substrate pumps
7. Facility for in-process pH calibration should be present with indications of pH and DO calibration parameter
8. Trend display for 6 process variables
9. The Control System of the Fermentor must Screen preferably with Graphical User Interface
10. Options for level control both by using probe or by using weighing balance
11. Integrated Thermostat System and cooling valve
12. Should have pump & valve totalizer
13. Gear Free stirrer drive/magnetic drive system
14. Stainless Steel SS 316L for medium contact parts
15. Culture Vessel height to be reducible via flexible adapter for exhaust cooler
16. Speed Controlled Feed Pump Connection
17. Gas Mixing of Air and O₂ with O₂ enrichment capability
18. Exchangeable Rotameters and provision for optional Air Flow Controller
19. Software for extended remote visualization, data acquisition and trend display
20. Fermentor System should meet the GAMP guidelines
21. System should have Condenser should be made of SS 316 heat exchanger fitted on the top of the flange with 0.22 micron PTFE filter for out gas and air filtration. Water inlet and out let for circulation of cold water to maintain the reaction volume.
22. Should be useful for chemostat operation
23. System should be quoted with suitable compressor (noise free and oil free)
24. Provision for off gas analyzer and turbidostat and same should be quoted in optional
25. System should be quoted with suitable computer and with software
26. Consumables and spares (extra) to be quoted separately or as optional.

Item No. 36

Particle Size Analyzer (1No)

Specifications

1. Should have dynamic light scattering based particle size measurement
2. System should additionally provide molecular size, zeta potential, mobility, charge, and possibly molecular weight of the molecule (specifically for proteins)
3. Size rang measurement from 0.2 nm to about 50 μm
4. Sample temperature control from 4 to 70 degree or expandable up to 90 degree Celsius
5. Should be useful for proteins, peptides and other large molecular weight molecules
6. Should be rapid, real-time providing particle size measurements over an extremely wide dynamic range.
7. Repeatability: < 1 to 2%
8. Low and large volume sample cells (optionally possibility to use as online system with HPLC as a detector system with a flow rate of about 1 ml/min)
9. Optionally should have appropriate stirring system for suspension system
10. System should have facility to monitor the change if particle size with time, temperature etc.
11. Should work with minimum sample concentration of 0.1 mg/ml
12. Optionally should have possibility to measure size and/or zeta potential as a function pH, conductivity and additives etc.
13. If a system is PC operated with suitable software, PC should be quoted optionally
14. System should be quoted with appropriate warranty and 3 years of maintenance