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TENDER No. 6 / 2012 – 2013

Specifications for Fast HPLC-PDA, immunoassay Fluorescence detector, kobra cell, etc along with UPS and required accessories.

(Item No.1, Tender No.6/2012-13)

The system should be designed for aflatoxin, amino acids and sugar analysis an automated Modular Fast Liquid Chromatography system with quaternary gradient pump capable of pumping four solvents at a time with a wide range of flow rate and with minimum dead volume. The system should have reliable and stable solvent delivery over a wide range of flow rate. The HPLC system should comprise of following modules with desired specifications.

Quaternary Pump

The pump should be

1) Low pressure mixing Quartenary.
2) Minimum 10 gradient profiles.
3) Capability of flow rate upto 2ml/min flow rate.
4) Capability of selecting 5-9 solvents.
5) Able to withstand 9000 psi pressure or above.
6) Able to with stand pH from 2-12.
7) Composition precision of < 0.15RSD or better.
8) Flow precision of 0.075% RSD or better.
9) Equipped with a pump seal wash facility.
10) The system should have a effective system delay volume of < 400µL.
11) Desired to have an integerated 4 channel degassing, and one additional for needle wash.

Autosampler

1) Injection volume range should be 0.1 to 250ul or more.
2) The linearity should be >0.999 caffeine, or better.
3) The sample compartment should be able to control temperature upto 4°C.
4) Autosampler should have a programmable needle wash.
5) Autosampler should be able to hold 96 vials or more.
6) Autosampler should have features such as auto dilution.

Column oven

The temperature control should be upto 90°C. It should have active preheating. It should have the facility to store and archive data from the individual columns. , such as number of injections, runtime, method used.

The warranty of said equipments should be 3 (Three) years (Comprehensive) and free of cost Annual Maintenance Contract for 4th and 5th year.

Fluorescence (FLR) detector

1) FLR Detector is a multi-channel, multi-wavelength fluorescence detector suitable for fast HPLC.
2) FLR detector' should have low-volume flow cell design, low-noise electronics and support for data rates up to 80 Hz.
3) FLR detector includes Leak Sensor assembly.
4) Detector wavelength range is 200-900nm.
5) Signal-to-noise ratio is >1000 (Water Raman band).
6) The detector incorporates four data channels, two wavelength pairs per channel, and supports both 2D and 3D scanning injection modes.
7) Instrument communications with the host computer are through Ethernet communications protocols.
8) Aflotoxin Analysis kit (kobra cell if required).
9) This kit contains everything required to perform required analysis that will show amounts of Aflatoxins (toxins) present in grains, nuts, spices, dairy products. (It includes the optional Large Volume FLR Flowcell).

ELSD

1) It should have fast data acquisition speed and compatible with fast HPLC.
2) Light Source: Tungsten halogen / laser pre-aligned.
3) Digital Data: 80 hz, detector: photomultiplier tube.
4) 4. Two nitrogen cylinders with regulators and gas purification panel with all required accessories.

Original LC Manufacturer's Licensed Software

1) Chromatography software with integrated database (current version license copy).
2) Software should have Instrument Method, Processing Method, Report Method, Custom field / Custom calculations.
3) Software should offer multiple levels of password, security to ensure the integrity of all your raw data and results and extensive audit trail.
4) Multiple user interfaces
5) Latest computer (4 GB RAM and 500GB Hard disc) and laser jet printer (back to back) with 19" LCD monitor with Antivirus total security for 3 years license copy.
6) External hard disc 1TB (2 No.)
7) UPS for the entire instrument (10 kva with 2 hours backup).

Accessories:

1) C18 columns (sub 2 micron) with guard columns (3 No.)
2) HILIC chemistry (2 No.)
3) Cyano column (1 No.)
4) PTFE vial 1.8 ml capacity (500 No.)
5) Amber colored Recovery Vial 1.8 ml capacity (500 no.)
6) Immuno affinity columns (500 nos.) applicable for aflatoxin analysis.
7) Consumable kit with details, required for one year smooth operation to be quoted as optional.
8) Unit price to be quoted for all accessories

Specification for High Resolution accurate Mass LCMS
(Item No.2, Tender No.6/2012-13)

The work station should be of FTMS Orbitrap/Q-TOF based technology and should demonstrate following minimum specifications for screening of chemical contaminants (pesticide residues, mycotoxins, etc.) and quantification of their residues:

Front-end HPLC: automated Modular Fast Liquid Chromatography system with quaternary gradient pump capable of pumping four solvents at a time with a wide range of flow rate and with minimum dead volume. The system should have reliable and stable solvent delivery over a wide range of flow rate. The HPLC system should comprise of following modules with desired specifications.

Quaternary Pump

The pump should be

- Low pressure mixing Quartenary.
- Minimum 10 gradient profiles.
- Capability of flow rate upto 2ml/min flow rate.
- Capability of selecting 5-9 solvents.
- Able to withstand 9000 psi pressure or above.
- Able to with stand pH from 2-12.
- Composition precision of < 0.15RSD or better.
- Flow precision of 0.075% RSD or better.
- Equipped with a pump seal wash facility.
- The system should have a effective system delay volume of < 400µL.
- Desired to have an integerated 4 channel degassing, and one additional for needle wash.

Autosampler

- Injection volume range should be 0.1 to 250ul or more.
- The linearity should be >0.999 caffeine, or better.
- The sample compartment should be able to control temperature upto 4°C.
- Autosampler should have a programmable needle wash.
- Autosampler should be able to hold 96 vials or more.
- Autosampler should have features such as auto dilution.

Column oven

The temperature control should be upto 90°C. It should have active preheating. It should have the facility to store and archive data from the individual columns. , such as number of injections, runtime, method used.

Source: 1) Dedicated separate ESI and APCI source with compatibility to wide flow rate for ESI 1ul-1ml/min and for APCI 50ul/min to 2ml/min.

2) DART source with Rapid vaporization of sample into the ionizing gas exiting a direct analysis in real time. Source should have a high electrical current through a metal wire screen to which sample has been applied. Should have capability to modulate the electrical current flow through the wires to facilitates either rapid desorption for the determination of single component samples or slower desorption where analysis of mixtures

Mass Analyzer: Hybrid system with quadurpole and high resolution Mass analyser with collision induced dissociation for MS/MS, The mass analyzer should be Orbitrap FTMS/ Q-TOF.

Mass Range: The Mass range up to 4000m/z for Orbitrap FTMS and TOF mass range of Q-TOF should be 25,000m/z or better.

Resolution: Minimum resolution of 40,000FWHM within the mass range m/z 200-900m/z or better higher resolution will be preferred. Scan rate/acquisition of 10 hz or better in MS and MS/MS mode

Mass Accuracy: System should demonstrate the Mass Accuracy measurement of 1ppm with internal calibration and <3ppm with external calibration.

Calibration: System should preferably be capable of performing internal calibration without introduction of any lock masses by picking-up any stable background ion.

Q- TOF system should have dual spray design for calibration on line where separate analyte and reference spray for calibration online.

Sensitivity: Sensitivity: System should demonstrate to produce S/N 100:1 or 2000 counts/sec for 200fg of reference standard in full scan and MS/MS.

MS Capability: System should be capable of performing Full MS, Selected Ion Monitoring (SIM), MS/MS of isolated ions with high resolution accurate mass detection. MS and MS/MS data throughout the run.

Positive/negative polarity switching.

Vacuum pump: air cooled Turbo molecular pump with rotary back up pumps

Dissociation: Should have collision induced dissociation CID/ HCD for MS and MS/MS analysis.

Dynamic Range: System should demonstrate the dynamic range minimum of 4 orders of Dynamic Range.

Tuning: System should have complete Auto-Tuning capability and tuning should be with easy window wizard and easy to perform

Software: The software should control, acquire and process the data from Mass spectrometer, Fast HPLC UV detector. Special software should be provided with HRAM library database of 500 compounds or more, Targeted screening, General Unknown screening, Quantitation, Database and Library matching, Elemental composition, Isotope ratio matching, Chemspider web search.

Hardware: Dell /IBM Core 2 Duo Processor with advance features recent model and compatible to the system with 20 inch monitor. An additional PC of the same configuration should be provided for easy data processing.

Quick Heal Total Security antivirus system with three (3) years of subscription.

Four external hard disks, each with minimum 1 TB capacity. (04 nos.)

HPLC system suitable for GPC cleanup application with following specifications:

- **Gradient pump** with serial dual reciprocating pistons with on-the-fly compression with pressure transducer purge valve with a flow rate range of 0.001 – 10 ml/min, and pressure in the range of 4000 psi (approx.) or more, Flow rate accuracy of ±0.1% , flow precision of <0.05% RSD and gradient delay volume of 690 uL.

  Additional Gradient pump to be offered (to be quoted separately).

- **Auotsampler** with Inline Split loop with sample capacity of 120 x 1.8/2 ml Vial and 15 x 10 ml vials, injection Volume of 1-100 uL, precision <0.25% RSD and accuracy ±0.5% & carryover of <0.004% and temp. control of: 4–45°C. at 22 deg C below ambient and temp. accuracy of ±2 °C

- **Diode Array Detector** with wavelength range of 190-800 nm and pixel resolution of 1 nm , drift : < 1 mAU/h and Noise :<±8 µAU , data collection rate of 100 Hz, wavelength accuracy of ±1.0 nm , analytical flow cell of 13uL & 10mm path length , temperature control for deuterium and tungsten lamp. 3D PDA software for peak purity, spectral library match and online spectral plot for comparing apex spectra with all data point on peak.

- **Column Oven (Peltier technology)** with, bi-directional fan-assisted convection for high temperature constancy cooling/ heating with Eluent Preheater, temp. accuracy of +/- 0.5º C , stability: +/- 0.1º C, Precision : +/- 0.1º C and temp. range: 5º C to 80 º C .

- **Programmable Fraction Collector** with max. flow rate of 150 ml/min, carryover volume of 15 uL , time collection, volume collection and tube change time <250ms, automatic shut down facility, Restart programming for repeated separation and two racks of 90 position x 8 ml tubes. rack of 18 mm OD tubes, 72 position

Chromatography software

- Chromatography data system for control, acquisition, processing, & Reporting software. Chromatography Software should have client/server, 32-bit design for Windows 7.0 64 bit
- It should be 21 CFR Part 11 compliance
- It should have flexible reporting as users desires for complete chromatography information Reporting.
- It should also record the instrument event such as injection, complete instrument settings, changes & conditions in real time.
- GPC Software
- Quick Heal Total Security antivirus with three years of subscription
- Least version suitable computer for GPC and Chromatography Software with laser Jet Printer (Back-to –Back) should be provided

System Qualifications and documentation (IQ, OQ and PQ) should be performed

Accessories

- Nitrogen generator with inbuilt imported compressor (noise and oil free)

- Gas cylinders (Helium and Argon as applicable) with regulator (2 No. each) with gas purification panel and all required accessories.

- An additional Nitrogen generator should be quoted with capacity to take care of the need to run two standard LC-MS/MS triple quad systems.

- UPS: 20 KVA on line UPS with minimum of 2 hour battery backup should be quoted.

- Suitable Columns and standards for GPC application in analyzing chemical contaminant (pesticides, mycotoxins, antibiotics, etc.) residues in fatty matrices (e.g. nuts, edible oil, etc.) to be quoted.

- Consumable kit with details, required for one year smooth operation to be quoted as optional.

The warranty of said equipments should be 3 (Three) years (Comprehensive) and free of cost Annual Maintenance Contract for 4th and 5th year.

Specifications for Upgradation / buy-back of existing Dionex HPLC– PDA to a fast HPLC –PDA or DAD with UPS and required accessories

(Item No.3, Tender No.6/2012-13)

The UHPLC+ System should comprise of Quaternary Gradient Pump with vacuum degasser, Autosampler, Diode Array Detector, Column Oven and Chromatography Software with the following specifications:-

Quaternary Gradient Pump

- Flow rate range 0.001–10 mL/min , Flow rate accuracy • ±0.1% , Flow precision < 0.05% RSD or < 0.01 min SD, whichever is greater, Pressure range 9000 psi and above, Proportioning accuracy • ±0.5% (of full scale), Proportioning precision < 0.15% SD, No. of eluent lines 4
- Solvent degassing Built-in, 4-channels.

Auotsampler

- Sample capacity 120 × 1-2 mL/2.0 mL vials
- Injection methods : In-line split-loop (flow-through), bypass mode, user defined programs, Injection volume range 0.01–100 µL, Injection volume accuracy ±0.5% at 50 and 90 µL, Carry over <0.004% , Sample thermostatting, 4–45 °C or 22 °C below ambient (thermostatted sampler version) , Sample temperature accuracy ±2 °C.

Diode Array Detector(DAD)/ Photo Diode Array Detector(PDA)

- Maximum Data Collection Rate 100 Hz, No. of diodes 512 or above, Wavelength Range 190 to 800 nm Drift , <1 mAU/h (typically <0.5 mAU/h) at 254 nm and 520 nm, with water at 1.0 mL/min
- Linearity <3% RSD and corr. coeff. >0.9995 up to 1.5 AU, typically <5% RSD and corr. coeff. ≥0.999 up to 2.0 AU.
- Light Source: Deuterium lamp, tungsten lamp.
- Wavelength Accuracy ±1.0 nm, self-calibration with D-alpha line, verification with holmium oxide filter Pixel resolution <1 nm

Column Oven

- Temperature Range 5 °C to 80 °C, maximum 18 °C below ambient, Temperature Accuracy ±0.5 °C, Temperature Stability ±0.1 °C, Temperature Precision ±0.1 °C.

Chromatography software

- Chromatography data system for control, acquisition, processing, & Reporting software.
- Chromatography Software should have client/server, 64-bit, Windows 7.
- It should have flexible reporting as users desires for complete chromatography information Reporting.
- It should also record the instrument event such as injection, complete instrument settings, changes & conditions in real time.
- Least version suitable computer for chromatography software with laser Jet Printer (Back-to –Back) should be provided and UPS 5 KVA with 2 hrs. back-up.
- Consumable kit with details, required for one year smooth operation to be quoted as optional.

The warranty of said equipments should be 3 (Three) years (Comprehensive) and free of cost Annual Maintenance Contract for 4th and 5th year.

Specification for Water Purification System
(Item No.4, Tender No.6/2012-13)

Ultrapure Water Purification System should be a 3 sub-unit system, as follows: (1) RO Pre-Treatment unit. (2) Tank / Reservoir unit. (3) Ultra-purification Unit. Single unit producing tap to ultra-pure water. In case of multiple units, the three sub-unit configuration should ensure easy maintenance. Failure of the one sub-unit should not affect the working of other system (no chance of complete breakdown). The equipment should accompany certificates of calibration, quality and conformity.

Stage –I – RO Water - Specifications

System should have:

- System should be capable of working without any external booster pump (ie- only atmospheric Pressure). External pre-filtration with booster pump (1-2 bar)
- Two stage RO Modules.
- Easy front access service door.
- GRID Control Panel (Graphically Represented Intuitive Display)
- RS232 parallel port.
- Product purity with:
    - Inorganics – min. - > 90% rejection.
    - Inorganics – Typical - Up to 98% rejection.
    - TOC – typical (dependent On feed water) - > 99% rejection.
    - Flow Rates - 7 L/Hour or higher, constant flow rate, temperature compensated.
    - Bacteria - < 5 CFU/mL
    - Particles - > 99% rejection
    - Feed Water - up to 2000 micro S/cm.

Stage –II – Tank Reservoir- Specifications

Tank Reservoir should be:

- Made up of Polyethylene.
- In square/conical shape and 25L.
- With level sensor for both RO and Ultrapure system.
- With Composite vent filter consisting of Soda lime, Charcoal and 0.45 um membrane to remove Micro-Organism and should not allow Carbon dioxide gas to flow in to the tank .
- Equipped with over flow valve.

Stage –III – Ultra pure Water – Specifications -

System should have:

- Real -time display of Resistivity/conductivity & Temperature of product water.
- Complete Sanitization- System should be capable of sanitizing complete system.
- Including all tubing, pump, UF cartridge, valves, sensors, UV chamber etc. It should not be restricted to limited portion.
- Multi-stage monitoring
- Electronically Tagged Cartridges.
- Intelligent dispensing (Drop by drop to 2 Lit/Min).

- Synthetic Quartz UV sleeve.
- Dry armature solenoids.
- Whisper quiet pump.
- Dual wave length UV lamp (185/254 nm)
- Ultrafiltration cartridge of 5kDa cut off with min. 2-3 years lifetime. Or, the system should have provision to have ultrafilter, to be quoted separately.
- Option to place final POU filter of 0.2 um.
- Auto Recirculation Option.
- Easy front access service door.
- Product Flow rate up to 2 Lit./min.
- Product water specification as,
    - Resistivity at 25 °C -18.2 M Ohm cm.
    - Conductivity - 0.055 uS/cm.
    - TOC (RO pre-treatment) - < 5 ppb*
    - Bacteria - < 1 CFU/mL.
    - Bacterial endotoxin - < 0.001 EU/mL
    - RNase/DNase - Free.
    - Particles - Ultrafilter.

***Dependent on feed water. Recommended feed < 50 ppb TOC.**

Specification for Homogenizer
(Item No.5, Tender No.5/2012-13)

Homogenizer

1. Magnetic drive – less technology
2. Preferably with no ball berating and no mechanical couplings
3. Speed range from 5,000 to 26,000 rpm
4. Integrated rpm-meter
5. Digital display for speed control
6. Dispersing volumes from 0.8 to 2000ml (as per tool specs)
7. Range of Viscosity from > 1 to < equal to 5,000 mPa.s
8. Noise level: appx 61 db A; Operation with water.
9. Power consumption: 130W
10. Voltage:100-240V, 47-63Hz

A. Accessories:

a) Shaft for Volume: 100-1500 ml
b) Shaft for Volume: 25 -250 ml
c) Shaft for Volume: 3-50 ml
d) Shaft for Volume:0.8-30 ml
e) Shaft for Volume:100-2000 ml

Replacement of the existing shimadzu GC 2010 to higher version of fast GC along with UPS and required accessories

(Item No.6, Tender No.6/2012-13)

The Gas chromatograph system should be capable of delivering advance separation capabilities and real time self monitoring intelligence to provide superior performance for all GS and GC-MS application. The Gas Chromatography system should have the following features for enhanced quantification/ qualification capabilities.

Chromatography Performance:

- Advance electronic pneumatic control (EPC) modules with Pressure set points adjustable in increment of 0.001Psi
- High performance GC oven temperature control from ambient temperature $+4^0$C t o 450 ^{0}C
- Supports minimum 20 oven ramps with 21 plateaus
- Maximum achievable temperature ramp rate: 120^0C /min
- Pressure set point and control precision to 0.001 psi provides more retention time locking precision for low- pressure applications.
- Atmospheric pressure and temperature compensation is standard, so results do not change, even when the laboratory environment does.
- Preprogrammed leak tests and Automatic Liquid Sampling – fully integrated into mainframe control

  GC system should be capable to support simultaneously two inlets and three detectors with state of art detector electronics.

  Injector:

  The injector should be a multi propose injector which should allow standard split/ split less combined with Temperature Programmable capabilities which allow for large Volume Injection.

  Temperature: with LCO2 it should go upto -50^0C

  It should offer following injection Modes: Hot or Cold Split / Split less, Pulsed Split/ Split less solvent Vent, Direct

  Auto Sampler: Auto Liquid Sampler with vial capacity of minimum 150 samples wit following specifications:

  Sample Discrimination: <=10%

  Area Reproducibility: <0.3%

  Carryover: Less than 1 part in 1000,000

  Flame Ionization Detector

  Helium Cylinders: Two Helium cylinders with regulators

  UPS: 10 KVA with 2 hour backup

  GC trolley for easy transportation

The above additions and deletions have been made as per the pre-bid conference held at this office on 27th February 2013.

The warranty of said equipments should be 3 (Three) years (Comprehensive) and free of cost Annual Maintenance Contract for 4th and 5th year.