



## TEA RESEARCH ASSOCIATION

### Tocklai Tea Research Institute

(An ISO 9001:2008 Certified Organisation)

CINNAMARA, JORHAT-785 008, ASSAM, INDIA

Ph.-91-376-2360973 / 2360974 / 2360475 Fax: 91-376-2360474, e-mail: [administration.tocklai@tocklai.net](mailto:administration.tocklai@tocklai.net), Web: [www.tocklai.net](http://www.tocklai.net)

Ref:3622/TOK/G.17/1497

4<sup>th</sup> September 2017

#### **Tender No. TRA-Tocklai/17-18/T-10 Dated 04.09.2017**

Sealed tenders in two parts (Technical bid & Price bid) are invited by the Director, Tea Research Association from reputed manufacturers / authorized dealers / importers for supply of Instruments / Equipments under **N.T.R.F. sponsored Quality Control Laboratory at Tocklai Tea Research Institute, Cinnamara, Jorhat – 785008, Assam**. Both the bid documents are to put in sealed envelopes separately super scribing the words “**Technical Bid** “ & “ **Price Bid**” which are to be put together in the sealed envelope super scribing the Tender No. The details of instruments / equipments are shown in ‘**Annexure – A**’ enclosed herewith.

**Last date of issue/receipt of tenders: 25.09.2017 up to 5.00 p.m.**

#### **Terms and Conditions:**

- 1) The tenderer should submit the following documents along with the tender:
  - a) Dealership certificate/authorization certificate
  - b) List of users
  - c) Up-to-date sales tax/GST /income tax clearance certificate
- 2) **Earnest money 2%** of the quoted amount is to be deposited by the tenderer in the form of Bank draft/Bankers certificate in favour of Tea Research Association payable at Jorhat.
- 3) Tenders must accompany with the product catalogues/ specification
- 4) Tenderers must quote the warranty period of the product.
- 5) Tenderers must quote the year-wise rate for AMC & CMC separately for a minimum period of 5 years beyond the warranty period.

TRA reserves the right to accept or reject the bids without assigning any reason thereof.

The tender document can be obtained from the office of the undersigned during working days from Monday to Friday (8-30 a.m to 5.00 p.m.) or **may be down loaded from the website –[www.tocklai.net](http://www.tocklai.net)**.

**Tender should be accompanied by separate Bank Draft of Rs.1000/- as tender cost (non refundable) and Earnest Money 2% of the quoted amount, failing which the tender will be rejected.** Both the drafts should be drawn in favour of the Tea Research Association payable at Jorhat. **The drafts for EMD and Tender Cost should be enclosed with “Price Bid” only.** All tenders should be sent to the following address:

The Director,  
Tea Research Association  
Tocklai Tea Research Institute,  
Cinnamara, Jorhat-785 008, Assam.

**DIRECTOR**

Registered Office:  
Tea Research Association, 113 Park Street , Kolkata - 700 016 , INDIA  
Ph : 91-033-22291815, 22297943, Fax : 91-033-22294271,  
Web : [www.tocklai.net](http://www.tocklai.net)



**Annexure - A****Equipments & Specifications**

| SI No | Item            | Specifications   |
|-------|-----------------|--|
| 1     | GC-MS/MS 1 Unit | <p><b><u>Standard Specifications:</u></b><br/>           Benchtop model Gas Chromatograph with Triple Quadrupole Mass Spectrometer (GC-MS/MS) required for analysis of residues of multiple pesticides in a single run in tea matrix. All the operation of GC and MS unit will be performed through software. The instrument should be able to perform the multi residue screening and quantification in a single run and confirm with MS/MS as per EU as well as USFDA and other regulatory guidelines.</p> <p><b>GC Column Oven</b><br/> <b>Temp range :</b> Ambient + 5°C to 450°C<br/> <input type="checkbox"/> Should support minimum 10 oven ramp steps<br/> <input type="checkbox"/> Fast oven cooling 450°C to 50°C in less than 5 minutes</p> <p><b>Inlet:</b> Two inlets are required-one Split / split less inlet and second one with large volume injection facility (PTV or equivalent)<br/> <input type="checkbox"/> Pressure range: 0–1000 kPa (0–145 psi)<br/> <input type="checkbox"/> Split Ratio: up to 1200:1 or better<br/> <input type="checkbox"/> Fast cooling facility for PTV preferably with Air</p> <p><b>Gas flow control:</b> Should be able to run in constant flow, ramped flow, constant pressure and ramped pressure modes.<br/> <input type="checkbox"/> Pressure set points minimum increments: 0.005 psi in all ranges.<br/> <input type="checkbox"/> Electronic pneumatic control for auto pressure regulation for split / Splitless operation, septum purge.</p> <p><b>Auto sampler:</b> Should be able to inject in to both the inlets (split/split less and PTV) simultaneously without making any manual hardware changes.<br/> <input type="checkbox"/> Minimum 98 sample vial capacity.<br/>           PTV Head Space auto-sampler system<br/>           Spares and consumables For 5 years</p> <p><b>Back flush technology:</b> Automated back flush is required and should be configurable with inlet and column, preferably mid column back flush for removal of high boiling interferences to ensure column life and low maintenance of the system.<br/>           4 different types of Low bleed column<br/>           Free consumables glass liner /insert for PTV<br/>           The system should be complete with required accessories for analysis of tea flavour components.</p> <p><b>Electronic Mass Flow Controller:</b></p> |

Device is capable of controlling flow rates between 5-500 ml/min. should be capable of recording pressures for sample logging and automatic leak checking.

**Tandem Mass Spectrometer**

**Mass Range:** Mass Range 50 to 1000 amu or better

Mass Analyser and Filters: Triple Quadrupole with filters to remove neutral noise/contamination for better sensitivity, Facility for active ion beam focusing

Analyser Temperature up to 200° C or better

Scan Modes Precursor, Product, Neutral Loss, SIM, SRM, MRM, Full Scan etc

**Dynamic Range:** Minimum 10<sup>5</sup>

**Linear Response:** Relative to sample concentration, for a specified compound, must be 6<sup>th</sup> orders of magnitude from the limit of detection

**Ionization Modes:** Electronic Ionisation (EI) and Optional positive and negative chemical ionization

**Electron Energy:** 10 to 120 Electron Volt (EV) user selectable or higher

Probe Direct infusion of sample to MS unit should be available or specify

**Ion Source:** Source temperature upto 300° C or better, Quick change over EI/CI mode, Inert EI source with dual filament

**Collision Cell:** Mention the gas used for collision, Facility to focus the ion beam for entering into the cell and exit the cell to be available Collision energy digitally controlled and specify the voltage

**Tune:** Auto tune facility and manual tuning option available

**Resolution :** Should be adjustable form 0.7 Da to 4 Da or Specify

**Dwell Time:** Minimum 1ms or better

**Scan speed:** Minimum 6000 amu/s or better

**MRM Speed:** Minimum 300 transitions/sec

**EI scan sensitivity:** S/N ≥ 1000 : 1 or Better with 1 pg Octafluoronaphthalene (OFN) from m/z 50 to 300 for m/z 272 or Otherwise specify the sensitivity in terms of Signal to Noise with the concentration of the chemical and injection volume and m/z

EI MRM sensitivity: S/N ≥ 6000 : 1 or better with 100 fg Octafluoronaphthalene (OFN) from m/z 272 >222 transition or Otherwise specify the sensitivity in terms of Signal to Noise with the concentration of the chemical and injection volume and m/z transition

**Detector:** Electron Multiplier or Photo Multiplier Provisions for lesser noise by the neutral ions other contaminations. Please mention the shelf life of the detector

Turbo Molecular Pump Air cooled with suitable capacity to bring fast vacuum. Easy and quick change over from EI or CI

|   |                 |   |
|---|-----------------|---|
|   |                 | <p>Should allow system to withstand carrier gas flow rate as suitable to application and intended use</p> <p><b>Library:</b> Licensed Latest NIST/Wiley etc library with latest version including data on pesticide to be provided along with the software Must includes spectral name and chemical structure.</p> <p>GC and MS operation of minimum one GC detector data while MS data acquisition is going on.</p> <p><b>Column:</b> Low bleed GC-MS/MS column suitable for analysis of multi-residues of pesticides of different classes from tea matrix.</p> <p><b>Uninterrupted Power Supply(UPS):</b> 3 phase in single phase out True online UPS of 10 KVA capacity or above with power factor correction and harmonic distortion (&lt; 5 % THD ; &lt; 3% Single Harmonic), Three phase 440 V for the smooth running of GC-MS/MS with battery with back up of 4 hr.</p> <p><b>Computer platform</b></p> <p>Suitable branded computer,i7 processor with 12 GB DDR3 Memory, up to 1 TB SATA hard drive (7200 RPM), DVD-RW, USB port, 24" LCD Monitor with suitable Operating System and LaserJet mono color printer.</p> <p><b>Training</b></p> <p>Training for the operation of instrument, understanding of software, data evaluation, report generation, method editing, tuning, trouble shooting and development of analytical methods etc will be provided free of cost during the 2 years warranty period and followed by 5 years CMC period. Training at the R &amp; D centre of the company has to be provided mandatory to minimum two analysts of the laboratory for better exposure and application studies. The application support has to be provided by the company for the development of method and analysis of sample for which the GC- MS/ MS instrument purchased at customer site.</p> <p>Validation and IQ/OQ/PQ documents for both GC modules and MS components The Installation Qualification, Operational Qualification and Performance Qualification of the instrument (GC and MS) has to be performed at the time of installation. The operational and performance qualification of the instrument has to be performed at least once in a year or after major breakdown of instrument. The job will be done free of cost during warranty and CMC period. At the time of supply of the instrument the IQ/OQ/PQ documents in soft and hard copies and essential validation kits for GC and MS has to be supplied free of cost.</p> |
| 2 | LC-MS/MS 1 Unit | <p><b><u>Standard Specifications:</u></b></p> <p><b>Mass Range:</b> 50 - 2000 amu or better</p>   |

**Scan Speed:** 12,000 amu/sec or better.

**Interface:** Rugged source capable of handling large batches of complex sample matrix like tea over a long period of time without performance degradation. The cleaning of source should be possible without venting the system.

**Vacuum system:** A robust high efficiency vacuum system with minimum maintenance and utility with low noise level and automatic vacuum lock system.

**Triple Quadrupole:** Quadrupole having high standards of mechanical tolerance and minimum coefficient of thermal expansion to ensure highest mass stability

**Mass Resolution:** Must be automatically adjusted to desired resolution (0.50 Da, 0.75 Da or 1.00 Da FWHM)

**Sensitivity:** 1 pg reserpine 100000:1 without smoothing peak to peak on column

**Collision Cell:** Specially designed collision cell allowing less dwell time. Suitable for high sensitivity MRM studies. Should be free of cross talk. Ionization source should include dual mode ESI, APCI. It should be easy to change the source without much hassle.

**Operating modes:** Tandem mass spectrometry should have following scan options

- a. Full scan
- b. Selected ion monitoring/recording (SIM/SIR)
- c. Product ion scanning
- d. Precursor ion scanning
- e. Neutral loss/gain scanning
- f. Multiple reaction monitoring
- g. Simultaneous full scan and MRM along with matrix monitoring to be performed in a single run
- h. +ve / -ve polarity switching time between alternate MRM scans: 50ms or less
- i. Automatic and manual tuning.

Information dependent acquisition system or equivalent scan mode of MRM to high sensitivity product ion scan for library confirmation.

**Dynamic range:** 5 orders of magnitude or better

**Detector :** The detector must have a digital range of 1 to  $e6$

cps It must operate both in +ve and -ve ion modes and back and must be capable of switching polarity rapidly

### **Quantification software system**

Application software for quantitative applications having the additional requirement of Quality Control (QC) checks to satisfy statutory or regulatory requirements must be available. This application must be compatible with LC/MS/MS data.

Data can be full scan, SIR/SIM or MRM.

Data Acquisition, Peak Integration, Calibration, Quantification and QC calculations must be fully automated. Quantification and QC parameters must be stored for each compound and individually selected and loaded into new methods.

The quantification method editor must be viewable in page view or as a spreadsheet

The application software must allow the monitoring of the molecular ion plus up to 4 confirmatory ions.

Technology for system optimization and status monitoring should monitor and perform the following parameter:

- System parameters checking and alerts
- Integrated sample/calibrant delivery system and programmable divert valve
- Automated mass calibration
- Automated sample tuning
- Automated SIR and MRM method development
- LC/MS system checks-automated on-column performance test.

The application software must flag samples in the browser report when:

- (a) The ion ratios fall out-with the user-defined values
- (b) The maximum blank acceptance level (user input) has been exceeded
- (c) The maximum concentration limit (user input) has been exceeded
- (d) The concentration is below the reporting concentration limit (user input)
- (e) The concentration falls below the minimum recovery % level (user input)
- (f) The concentration falls above the maximum recovery % level (user input)
- (g) The coefficient of determination for a

calibration curve falls below a user-set level

- (h) QC samples fall outside a user-defined number of standard deviations from the mean
- (i) The peak of the compound of interest falls below a user defined S/N ratio

**Library:** Software should have the latest library database of around 1000 compounds viz. (Pesticides, Antibiotic residues, veterinary drugs residue, Aminoglycosides, macrolides, Dyes, Mycotoxins, Vitamins, etc.).

Pesticide database should contain Molecular formula, Mono isotopic mass, Parent ion, Cone voltage(V), Product ion 1, Collision energy(eV) Product ion 2, RT and sensitivity.

Simple report format & reporting system software should be ISO compliance.

**Computer platform**  
Suitable branded computer,i7 processor with 12 GB DDR3 Memory, up to 1 TB SATA hard drive (7200 RPM), DVD-RW, USB port, 24" LCD Monitor with suitable Operating System and LaserJet mono color printer.

**Nitrogen Generator**  
Highly reputed international brand of Nitrogen generator with inbuilt compressor with **low noise** should provided. Nitrogen gas generator should be supplying required purity, pressure and flow rate, as required for the LC-MS/MS instrument. Should be covered under five years CMC with at least two Preventive maintenance along with PM kit each year. Satisfactory performance certificate should be given every six month of preventive maintenance visit. The responsibility of PM visits is the supplier of LC-MSMS during warranty period

Five years CMC after the warranty period including all spares, accessories and consumables, at least two Preventive maintenance along with PM kit in each year and unlimited breakdown visits to be quoted.

**Gas cylinders**  
Suitable gas cylinders (UHP) of 03 Nos with all accessories such as stainless steel double stage regulator, gas purification panel unit, cylinder cage or Bracket etc should be supplied and commissioned. The gas lining panel work should be done by the supplier for the connection of instrument. All the items cylinder, regulator, gas purification panel unit, cylinder cage or Bracket etc should be covered under five

years CMC with at least one Preventive maintenance along with PM kit each year.

**HPLC (Fast LC)**

Online solvent degasser unit

Quaternary/ Binary System with vacuum degasser (2 channel built in degasser), Auto sampler, column oven, 4 nos of 2.1 x 100 mm and 2 X50 mm column coated with suitable phase for effective separation of different group of pesticides including glyphosate, gluphosinate ammonium, aflatoxin and pyrrolizidine alkaloids and suitable guard columns.

Flow rate – 0.01 – 2 ml/min.

Syringe should be capable of taking even though the sample is in less quantity

It should have the facility of keeping the sample in a cooling condition (temperature range from 4 to 50<sup>0</sup> C

Operating pressure – up to 15000 psi

Flow accuracy – +0.5% RSD

Flow precision – +0.1%

Injection vol. – 0.5-20 µl or more

Auto sampler: The Auto sampler must accommodate not less than 50 vials

Injection accuracy – More than 0.3% RSD

Vial capacity – up to 2 ml

Needle washing facility – should have needle washing facility from internal and external side programmable

Built in dilution and derivative system facility

Syringe size –Should accommodate the injection volume stated above.

Linearity – > 0.999 coefficient of deviation Precision - < 0.5% RSD

Sample carryover - <0.005%

Seal wash – Integral and programmable

Column oven Temperature range with control

Spares and consumables For 5 years

**Start up Kit:** LC-MS/MS start up kit should be supplied as standard

**Uninterrupted Power Supply (UPS)**

3 phase in single phase out True online UPS of 10 KVA capacity or above with power factor correction and harmonic distortion (< 5 % THD ; < 3% Single Harmonic), Three phase 440 V for the smooth running of LC-MS/MS with battery with back up of 4 hr

**Other Conditions**

Model & year of introduction of the Instrument Should be



|  |  |   |
|--|--|---|
|  |  | <p>mentioned in the tender along with original brochures/catalogues.</p> <p><b>Experience:</b> The supplier should have experience of at least 20 installations and operating LC–MS/MS in India.</p> <p><b>Training</b></p> <p>Training for the operation of instrument, understanding of software, data evaluation, report generation, method editing, tuning, trouble shooting and development of analytical methods etc will be provided free of cost during the 2 year warranty period and 5 years CMC period. Training at the R &amp; D centre of the company has to be provided mandatory to minimum two analysts of the laboratory for better exposure and application studies.</p> <p>The application support has to be provided by the company for the development of method and analysis of sample for which the LC-MS/MS instrument purchased at customer site. Validation and IQ/OQ/PQ documents for both LC modules and MS components, the Installation Qualification,</p> <p>Operational qualification and Performance Qualification of the instrument (LC and MS) has to be performed at the time of installation.</p> <p>The operational and performance qualification of the instrument has to be performed at least once in a year or after major breakdown of instrument. The job will be done free of cost during warranty and CMC period. At the time of supply of the instrument the IQ/OQ/PQ documents in soft and hard copies and essential validation kits for LC and MS-MS has to be supplied free of cost.</p> |
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