

भा आ अ प-राष्ट्रीय व्यावसायिक स्वास्थ्य संस्थान
ICMR-NATIONAL INSTITUTE OF OCCUPATIONAL HEALTH

मेघाणीनगर, अहमदाबाद - 380016 / MEGHANINAGAR, AHMEDABAD-380016

5/LCMSMS[NIOH&ROHCS]/2019-20

26/02/2020

CORRIGENDUM

Tender ID : 2020_DoHR_518320_1

Equipment Name : LC-MS/MS - Qty. 04

Tender Published Date : 13/02/2020

Tender Due Date : 05/03/2020

With reference to above tender, all the firms / agencies / companies / bidders are requested to note following changes :

1. Change in 'Technical Specifications'
2. Supply Quantity :
Qty. is reduced to **total 03 units** instead of total 04.
(02 Units for ICMR-NIOH, Ahmedabad and 01 Unit for ROHC-S. Bangalore)
3. EMD is Reduced to **Rs.9,00,000/-** instead of previously fixed EMD of Rs.12,00,000/-.

There is no change in terms and conditions, due date and tender opening date etc.

K. Arora
26/02/2020
Offg. Admin. Officer



Technical specification: LC-MS/MS (Liquid Chromatography Mass Spectrophotometer)

Proposed applications: The LC-MS/MS is intended to use for the qualitative and quantitative analysis of pesticides, phthalates, and their metabolites and other contaminants like acrylamide in the biological matrices and health risk assessment.

A. Specifications for Ultra High-Performance Liquid Chromatography System (UHPLC)

The system should have Quaternary or Binary gradient pump with 1 to 4 solvents integrated with inbuilt high efficiency degassing units, minimum 4 lines with facility for auto-sampler rinsing and improved gas flow stability.

The LC pump should have following features:

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| Pump | Quaternary or Binary gradient pump |
| Flow rate | 0.01ml to 2 ml/min or better in 0.001 ml gradient with accuracy $\pm 1\%$ and precision 0.1% or better at 1 mL/min |
| Pressure range | at least 15000 psi 1ml/ min or better should be offered |
| Purging | Purging of pumps automated as well as manually. |
| Flow accuracy | $\pm 1\%$ |
| Type of gradient | Linear and non-linear |
| pH range | 2-12 pH (Preferable) |
| Reservoir System | Mobile phase reservoir system to accommodate at least 3-4 bottles each of 1 L with cork and frit. |

Auto Sampler (Automated operation controllable through MS/MS software)

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| Injection loop volume range | 0.1 to 25 μ l |
| Capacity of sample tray | 96 vials (1.5 to 2 ml vial holder) or more |
| Temperature range | 5°C to 40°C |
| Sample carryover | <0.3% or better |

Column oven: It must be Forced/Peltier air circulation, with leak sensor.

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| Temperature range | The temperature control range should be 10°C below room temperature to 85°C or better. |
| Temperature accuracy | $\pm 0.5^\circ\text{C}$ (Preferable) |
| Temperature stability | $\pm 0.1^\circ\text{C}$ (Preferable) |

B. Specifications for MS/MS System (Triple Quadrupole)

Ionization Source

- Instrument should have ESI (Electrospray Ionization) and (ESI-APCI-Dual mode) Ionization source. The probe capable to detect and quantitation preferably in picogram/femtogram levels. The electrospray with concentric gas flow for nebulization to cover flow rates from 2 μ l /min to 200 μ l/min. The cleaning and maintenance of ion source and Desolvation line should be simple and without breaking the vacuum of the system.
- The desolvation temperature above 550°C or higher for the analysis polar pesticide residues in sample.

Mode of ionization

- Positive and Negative (or) dual mode. The polarity switching time between alternate MRM scans should be 25 millisecond or less (the supporting documents are enclosed).

Mass analyser

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| Mass analyser | Triple Quadrupole analyser |
| Mass range | 10 to 2000 m/z (or) better. |
| Mass stability | < 0.1 Da in 24 hours (or) better |
| Mass resolution | 0.7 Da (or) lower |
| Scan rate | 12000 amu/sec or more |

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| Dwell time & Pause time | < 1 milli second or better |
| Detector Sensitivity | |
| Detector | High efficiency Electron Multiplier/Photomultiplier. It must operate positive and negative ion modes in parallel. <i>The detector life span should be 10 years, if within this period it gets breakdown, this has to be replaced free of cost. The terms and conditions have to be applicable during the AMC. In short, from the date of installation up to 10 years it should be replaced.</i> |
| Sensitivity | a) ESI Positive: 1 pg reserpine, S/N \geq 5,00,000:1 or better based on 1- μ L injection without smoothing data (Raw data). b) ESI Negative: 1 pg chloramphenicol, S/N \geq 5,00,000:1 or better without smoothing data based on 1- μ L injection. |
| The sensitivity specifications must be available on the website of the manufacturer and official specifications sheet/brochure of the principal website. Performance specifications will not be entertained. The performance as quoted must be demonstrated during installation. Documentary proof for both to be provided as per manufacturer brochure. | |
| Dynamic range | Up to 10^6 (or) better (The document evidence to be submitted for polar pesticides and phthalates metabolites or vendor may select any of the molecule). |
| MRM acquisition rate | > 500 Data Points/ Sec |
| Scan options | The scan option should be Full Scan, Single Ion Monitor/Recording (SIM/SIR), Product ion, Precursor ion, Neutral loss or gain, Multiple Reaction Monitor (MRM), Multiple time segment MRM and Automated tuning. |
| Vacuum system | |
| <ul style="list-style-type: none"> The suitable and efficient oil or oil free vacuum system with minimum maintenance to be provided with instrument. The system should have vacuum safety features to prevent damage to the instrument in case of failure. | |
| Key Performance Criteria: | |
| <ul style="list-style-type: none"> The instrument to quantify \leq 1 ppb (LOQ) level of listed pesticides and phthalates metabolites Polar Pesticides: Glyphosate, Gluphosinate, AMPA, Ethephon, Fosetyl Al and phosphonic acid, chlorate and perchlorate their metabolites which are quantified by \leq 1 ppb; Captan, Folpet, Paraquat and Diquat: 5- 10 ppb Phthalate metabolites for example Dimethyl dithiophosphate (DMDTP), Diethyl Phosphate (DEP) in a single run without any derivation/direct injection or vendor may be selected for the phthalate metabolites, which are quantified by \leq 1 ppb. At least Minimum 400 number of pesticides to be quantified in single run. The technical qualification of the bids are subject to verification. The key performance criteria to be demonstrated during the installation. All the above-mentioned application data to be enclosed along with technical document The vendor should enclose scientific articles published in the peer reviewed journals and application note for specified model. The unknown sample will be provided for evaluation of technical performance. | |
| C. Data station with software: | |
| I | The data system should be able to provide single platform of the software for controlling simultaneously Liquid Chromatography and Triple Quadrupole Mass Spectrometer as well as vacuum pump, gases, all modes specified in scan modes. The software should controlled auto tune to enable quick start up for quantitative analysis. |
| II | The latest branded computer should supply with licenced Window 10 operating system, i7 Processor, 32 GB DDR3 RAM, 16 TB hard disk, 32" LED monitor, DVD R/WR, graphic card, licenced latest Microsoft office software and total security system having an Antivirus programme with minimum 3 |

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| | years subscription with a latest color laser jet automatic back to Suitable factory tested system with above specified configuration. | back printer should be supplied or |
| III | The software should execute real time analysis, multi-tasking facility, background correction, zooming of chromatograms, calibration run with custom report flexibility. | sample schedule, post run analysis, by multilevel calibration curve along |
| IV | The application software must flag samples in a browser report: <ul style="list-style-type: none"> 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. | |
| V | Software should be capable of acquiring data & controlling the entire LC MS/MS system and is to be supplied with the required system controller. | |
| VI | Software should precisely derive standard quantitative parameters including retention time, area under the curve, concentration, percentage conversion etc. The software should have not editable reporting format as per requirement of ISO/IEC 17025: 2017 under the clause (7.11.3) of data integrity. | |
| VII | Workstation Software should perform system suitability test, automate the checking & recording of Instrument consumables life & preventive maintenance for GLP/GMP compliance. | system check, software function to |
| VIII | The software must be able to perform automatic optimization of MRM using flow injection and MRM database for minimum 500 pesticides and their metabolites or mandatory with LC and MS parameters. Which includes name of the compound, mono isotopic mass, application of the compound, cone voltage, Collision Energy, parent ion, product ion MRM. | |
| IX | Also, latest original company licensed software with life-time validity and should have capabilities to perform the following functions. <ul style="list-style-type: none"> • Automated calibration and quantitative optimization. • Perform alternating positive/negative scans in one run. Automated quantitation and reporting of acquired samples. Should also quote data processing with automation-based review on peak shouldering, interference etc. The available MRM catalogues or tables containing the optimized instrument parameters for thousands of compounds can also be used to save the time with method development. The software should be 21 CFR part 11 compliant, user friendly and compatible with latest operating system. New versions developed during warranty period should be provided free of cost. | |
| X | The supplier shall have application laboratory in India/abroad to support the application requirement and training needs. | |
| XI | Bidder shall provide a list of factory trained service/application engineers/experts of the model quoted and submit the certificate. | |
| XII | The supplier shall provide a list of installations of quoted model in testing laboratories from government and private sector during last three years with contact details. | |
| Power Supply | | |
| | <ul style="list-style-type: none"> • LC-MS/MS system should work at power ratings of 220 Volts and phase/Indian power rating. | 50 Hz frequency on single/ three |
| D. Essential Accessories | | |
| | <ul style="list-style-type: none"> • Should supply 15 KVA online UPS with 2-3 hours battery backup at full load and maintenance free battery. • The gas generator should be portable and highly durable, low noise, vibration free, drying system and auto drain valve with inbuilt compressor. It should be able to supply the gases (32 L/min) required for the LC-MS/MS instrument at required purity, pressure and flow rate. | |

- Suitable filled gas cylinders (2 cylinders for each gas) are required with test certificates from manufactures and no objection certificate from explosive department along with SS double stage regulators, gas pipes with fittings and purifier for the system.
- Net gear RN31400 with cloud setting- Ready NAS 300 Series 4-Bay, 4 x 4TB HDD (NAS supported) or superior.
- Branded split AC (2 Ton capacity): 02 nos. (Copper condenser with five-star rating)
- A suitable anti vibration table platform with granite top (telephone black) of appropriate dimension and two chairs to be provided for the installation of the instrument.
- The following suitable spares/consumables to be provided for the instruments

Column:

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| a. RP C-18, $\leq 2 \mu$, 100 mm X 2.1 mm | : 10 Nos. |
| b. RP C-18, $\leq 2 \mu$, 50 mm X 2.1 mm | : 05 Nos. |
| c. Biphenyl column 1.9 μ , 100 mm X 2.1 mm | : 05 Nos. |
| d. QuPPE Columns recommended for polar pesticides or Equivalent | : 04 Nos. |
| e. Phenyl Hexyl 1.7 μ , 100 mm X 3 μ or Equivalent HILIC Columns with guard column bare silica | : 04 Nos. |

 - Should supply guard column:

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| I. Suitable cartridge-based guard columns from the same supplier as the columns asked, should be provided | : 10 Nos. |
| II. Inline filter/Frit/Cartridge | : 20 Nos. |
 - Tool kit : 01 Set
 - Filter assembly with suitable pump and sonicator to accommodate minimum 4 bottles of 1 L : 01 Set .
 - Nylon Syringe filter, 0.22 μ , 13mm diameter : 1000 Nos.
 - Bottle for reservoir (1 L.) : 12 Nos.
 - Suction filter of mobile phase for LC : 24 Nos.
 - Auto sampler tray extra excluding with system : 01 No.
 - Alconox powder for cleaning System : 10 Pks.
 - Sample vials (2 mL capacity) with cap having pre-slit septa: : 1000 Nos.
 - Peek tube : 10 Feet
 - LC MS/MS suitable mixture of standard pesticide which may contain more than 200 pesticides and method has to be developed with same pesticide during installation and commissioning of the equipment.
 - The supplier should provide IQ/OQ for the system during installation.
 - The instrument training will be provided to laboratory staff, which includes familiarisation with the software and how to develop the analytical methods and all operations of the instruments.



J. K. K. K.
26/02/2020