

Equipment 4: Ultra High Performance Liquid Chromatograph (UHPLC) Location: Food Safety Laboratory (FSL) Quantity: 1	Compliance Checklist (Yes/ No)
Introduction The proposed system for tender must be an ultra-high performance liquid chromatograph (UHPLC) capable of high sensitivity and high resolution analysis. This tender also includes the option to purchase 2-year post warranty comprehensive maintenance contract on an annual basis.	
General Requirements A robust and sensitive bench top/ stand-alone UHPLC shall have the configurations and support provided as follows: 1. Pumps 2. Degasser 3. Photodiode Array (PDA) Ultraviolet-Visible Spectroscopy (UV-Vis) Detector 4. Fluorescence Detector 5. Autosampler 6. Column Oven 7. Computer Hardware & Software 8. Data Management Software System 9. Site inspection, Installation, Commissioning & Warranty 10. Training 11. Technical Support & Existing Method Transfer 12. Accreditation/ Certifications/ Track Records 13. Evaluation Test 14. Warranty and 2-year Post-Warranty Comprehensive Maintenance Contract 15. Replacement and Purchase of Components 16. Guarantee The proposed system shall minimally meet the following requirements:	Yes/ No
(1) Pump	
1.1 The pump must be a high pressure binary pump or low pressure quaternary pump. 1.2 The pump flow rate must be settable for at least between 0.01 to 2 mL/min in not more than 1 µL/min increments. 1.3 The flow rate accuracy should not be more than ±1% at 0.5 to 2.0 mL/min. 1.4 The flow rate precision should not be more than 0.08% RSD. 1.5 The maximum operating pressure of the pump must be at least 15,000 psi, with user selectable upper and lower pressure limits within the settable range of flow rate. 1.6 The pump solvent composition must be settable from 0.0 – 100%. 1.7 The pump should have compositional accuracy of not more than ±0.5%. 1.8 The compositional precision of the pump must be less than or equal to 0.15% RSD. 1.9 Reservoir tray must be supplied. 1.10 It must have a leak sensor as a safety feature.	Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No

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(2) Degasser	
2.1 The proposed configuration must include a degassing unit.	Yes/ No
(3) Photodiode Array (PDA) Ultraviolet-Visible Spectroscopy (UV-Vis) Detector	
3.1 The wavelength range should be at least 190 nm – 700 nm that is covered by a single deuterium lamp.	Yes/ No
3.2 The detector must have standard analytical flow cell with 10 mm path length and a volume of not more than 1 µL.	Yes/ No
3.3 The detector must also include a high sensitivity flow cell with at least 25 mm path length.	Yes/ No
3.4 The detector must have a wavelength accuracy of lesser than or equal to ±1 nm.	Yes/ No
3.5 It must be able to perform signal processing with sampling frequency of 80 Hz and higher.	Yes/ No
3.6 The detector must be able to collect at least 8 independent data channels simultaneously.	Yes/ No
(4) Fluorescence Detector	
4.1 The detector must have a Xenon lamp.	Yes/ No
4.2 The detector must have minimum wavelength range of 200 to 750 nm.	Yes/ No
4.3 The wavelength accuracy should not be more than ±3 nm.	Yes/ No
4.4 The wavelength repeatability should not be more than ±0.25 nm.	Yes/ No
4.5 The signal to noise ratio for the Raman peak of water should be greater than 800 with the noise measured at the signal and without using a dark signal as the noise reference.	Yes/ No
4.6 The detector must have a maximum data acquisition rate of at least 70 Hz.	Yes/ No
(5) Autosampler	
5.1 The sample injection volume should be variable between 0.1 to at least 40 µL.	Yes/ No
5.2 The maximum operating pressure should be at least 15,000 psi.	Yes/ No
5.3 The temperature must be settable for a minimal range of 4 to 40 °C with no more than 1 °C increment.	Yes/ No
5.4 The carryover must be below 0.005%.	Yes/ No
5.5 The injection volume accuracy must not be more than 2% at 10 µL.	Yes/ No
5.6 The injection volume precision must not be more than 0.5% RSD at 5 µL.	Yes/ No
5.7 The autosampler must be able to accommodate at least 100 of the standard 2-mL vials.	Yes/ No
(6) Column Oven	
6.1 The oven must able to support temperature range of 20 to 80 °C or even larger.	Yes/ No
6.2 The temperature accuracy should not be more than ±0.5 °C.	Yes/ No
6.3 The oven should have a built-in solvent leak sensor.	Yes/ No
6.4 It should be capable of complex temperature programming in linear and step programs.	Yes/ No
6.5 It should be able to handle at least one unit of 25 cm column.	Yes/ No
(7) Computer Hardware & Software	
7.1 Intel I5 Processor 7.2 8 GB RAM Memory 7.3 1 TB Hard disk storage 7.4 DVD-RW ROM 7.5 19" LCD monitor 7.6 Windows 7 7.7 Microsoft Office 2013 or better 7.8 101 keys keyboard 7.9 Mouse & mouse pad	Yes/ No

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7.10 Laser printer capable of double-sided printing	
(8) Data Management Software System	
8.1 The software must be capable of performing full instrument control, automation, data acquisition, qualitative and quantitative data processing as well as report creation.	Yes/ No
8.2 The software should perform customized continuous analyses according to the conditions specified for each sample. Priority samples may be inserted in the queue during the automated run.	Yes/ No
8.3 It must be possible for data acquisition and processing to be performed simultaneously.	Yes/ No
8.4 The software must allow programmed shutdown of the instrument, including the stopping of pump flow and the lamps in the detector.	Yes/ No
8.5 The software must have its own log files for audit trail.	Yes/ No
(9) Site Inspection, Installation, Commission	
9.1 Site inspection, on-site installation and commissioning by factory-trained engineer is required.	Yes/ No
9.2 The instrument as well as the accompanying accessories and devices shall have a stable platform to sit on at the designated area while not compromising the safety of the users. Should there be any changes to be made to the furniture or layout of the site, all costs shall be borne by the vendor.	Yes/ No
9.3 An endorsed copy of the risk assessment form for the installation of the instrument must be submitted to the laboratory before the delivery. A template of this form can be found on Ministry of Manpower (MOM) website.	Yes/ No
9.4 During instrument commissioning, the engineer must validate the LC instrument based on the vendor's installation specifications on-site. A copy of the validation report must be submitted to HSA Food Safety Laboratory upon completion of commissioning.	Yes/ No
9.5 Delivery shall be completed by 31st March 2018.	Yes/ No
(10) Training	
10.1 The vendor shall provide basic onsite training to all users of the system in the laboratory (approx. 40 users) and the training programme shall minimally include: a) Theory of LC b) Hands-on practical session (covering data acquisition, data processing, reporting as well as basic maintenance)	Yes/ No
10.2 Advanced training shall also be provided to approx. 8-10 users and shall minimally include operation, troubleshooting, method development and maintenance of the system.	Yes/ No
10.3 A proposed training programme and schedule must be appended with the tender submission.	Yes/ No
10.4 Training must be conducted by trained personnel. A copy of the training certificate shall be provided upon request.	Yes/ No
10.5 Refresher course for approx. 3-4 users must be provided for every 3 years upon request.	Yes/ No
(11) Technical Support & Existing Method Transfer	
11.1 Tenderer must be able to provide application and maintenance support to assist the laboratory in method developments, provide on-site training (hands-on as well as theory) as well as readily available parts and consumables on demand. The qualifications of service engineers and product specialists must be submitted upon request.	Yes/ No
11.2 Tenderer is required to assist the laboratory to set up running conditions for existing and new test methods as requested by HSA Food Safety Laboratory.	Yes/ No

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11.3 At least Two (2) units of the liquid chromatograph columns must be provided for the analysis of aflatoxins B1, B2, G1 and G2.	Yes/ No
11.4 Tenderer is required to assist the laboratory to migrate existing methods to the proposed system until the methods are fully validated.	Yes/ No
(12) Accreditation / Certification/ Track Records	
12.1 The manufacturer of the product and the company shall preferably be ISO 9001 certified or equivalent. Please provide the details set out in this tender. A copy of the valid accreditation certificates must be submitted upon request.	Yes/ No
12.2 At least two units of the model proposed in this tender or similar series must have been sold and commissioned in Singapore from 2013 to present. Please provide the details of the LC system(s) in Annex E Performance Summary .	Yes/ No
(13) Sample Analysis & Evaluation Test	
13.1 Tenderer is required to complete the evaluation test as part of the requirement for the tender.	Yes/ No
13.2 The sample used for the evaluation test are to be supplied by HSA. Due to the sensitivity of the analytes, the sample must be evaluated locally and not to be sent overseas. All samples should be tested within a week from collection. The instructions for sample testing will be provided together with collection of sample.	Yes/ No
13.3 The proposed system in this tender must be used for the analysis for evaluation test.	Yes/ No
13.4 The sample analysis shall not make use of any form of derivitization.	Yes/ No
13.5 The S/N of all analyte peaks must be greater than 3.	Yes/ No
13.6 The resolution (R_s) between two nearest analyte peaks must be at least 2 using the following formula.	Yes/ No
$R_s = \frac{d \times 1.18}{(w_{0.5h,1} + w_{0.5h,2})}$ $w_{0.5h,1}, w_{0.5h,2}$ = Full width at half maximum (FWHM) d = difference of retention time $t_2 - t_1, t_1 < t_2$	
13.7 The result of the sample analysis must include the following: i. Method parameters for the chromatographic system including mobile phase, column, injection volume, column temperature, pump flow rate, operator's name, date of analysis, date of sample collection and etc.; and ii. Chromatograms with proper peak labelling and integration, S/N calculation, retention time of analytes, peak width at half height of peaks along with a complete results table.	Yes/ No
13.8 All participating tenderers shall collect the sample and the instructions for sample evaluation from HSA on 10 November 2017 from 9 am to 4 pm . Tenderer shall write in to HSA to request for alternative collection dates i.e. within 2 working days after 10 November 2017 should they be unable to collect on the stipulated date. Please contact Hui Yi @ 6213 0852 for arrangement. Tenderer must submit results by tender closing date in hard copy or soft copy (email) to LIM Hui Yi@hsa.gov.sg and CHONG Meow Yee@hsa.gov.sg . Should Tenderer be unable to submit sample testing result by the stipulated period, tenderer shall write in to request for extension of a maximum of 3 working days before the tender is closed.	Yes/ No
13.9 Tenderer who do not participate in the sample evaluation test or fail to follow the stipulated instructions to perform the test or fail to submit the test reports by the stipulated deadline shall be disqualified from the evaluation.	Yes/ No

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REPLACEMENT AND PURCHASE OF COMPONENTS 15.1 The Contractor shall inform the Authority of any part or component of the Equipment that needs to be replaced. Prior approval must be issued by the Authority before the replacement may be effected unless the replacement required is deemed urgent by the Authority in which case a verbal approval (which shall subsequently be confirmed in writing) obtained from an authorised officer of the Authority shall suffice. 15.2 The Contractor shall use all reasonable endeavors to supply only original or genuine replacement components, which are required to maintain the Equipment in Good Working Order. 15.3 The Contractor shall bill the Authority after the maintenance has been completed, together with detailed and signed service reports for HSA designated staff.	Yes/ No Yes/ No Yes/ No
(16) Guarantee	
16.1 The Contractor hereby warrants that all the Equipment and every part or unit thereof serviced by the Contractor shall conform to the requirements of this Contract and be free from any defect or deficiency in their performance or workmanship for a period of three (3 months) from the date of acceptance of the Services by the Authority (hereinafter referred to as "the Equipment Guarantee Period"). The Contractor hereby also warrants that all materials and every part or unit thereof, used for the Services shall be free from any defect in manufacture or any defect arising out of design, workmanship or materials used or any failure or malfunction due to quality of material, workmanship, design, assembly, installation or integration for a period of three (3) months from the date of acceptance of the materials by the Authority (hereinafter referred to as "the Materials Guarantee Period"). The Equipment Guarantee Period and the Materials Guarantee Period shall collectively be known as the "Guarantee Period". 16.2 Where during the Guarantee Period, any part or unit of the Equipment serviced by the Contractor or materials used for the Services or supplied therefor are found to be defective of any of the reasons specific in Clause Guarantee-(a) above, the Contractor shall at the written request of the Authority replace the same at the expense (including freight charges, transportation costs or other incidental charges) of the Contractor or if the Authority so agrees make good or repair the same at the expense (including freight charges, transportation costs and other incidental charges) within a Guarantee Turn-Around-Time of seven (7) working days. The Equipment or materials or part or unit thereof so replaced or repaired shall be subjected to the Guarantee under this Clause for the Authority or three (3) months whichever is later and such balance of the Guarantee Period shall begin to run only from the date of receipt of the part or unit so replaced or repaired by the Authority.	Yes/ No Yes/ No

COMPLIANCE OF REQUIREMENT SPECIFICATIONS

I hereby confirm that I can meet all the specifications and requirements as stated in Part 3: Requirement Specifications – Equipment 4.

Tenderer's (as *Principal/Agent)
Company or Business Registration No:

200512450H

Tenderer's official
Stamp:



Authorized Signature

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Name: JOANNA ANG

Designation: ACCOUNT MANAGER

Please indicate any non-compliance to requirement specifications here should there be any.

Reference To	Remarks
	N.A