

Minutes of the Pre-bid Meeting

1. **Name of the equipment:** Procurement of Gas Chromatography-Mass Spectrometry (GC-MS) and integrating it with existing NETZSCH STA 449 F5 Jupiter system for evolved gas analysis (AMPRI/PUREQP/58 (2026-2027)).
2. **Date of the meeting:** 01/10/2026
3. Companies represented:
 - I. **M/s. NETZSCH Technologies India Pvt. Ltd.:** Mr. Vikas Sharma, Regional Sales Manager and Mr. Nihal Singh, Engineer.
 - II. **M/s. Agilent Technologies India Pvt. Ltd.:** Mr. Rohit Ojha, Product Specialist, Gas Phase Division.
 - III. Mr. Bhalchandra Mhaskar, Business Manager, **M/s Thermo Fisher Scientific India Pvt. Ltd.**, send their queries through e-mail.
4. Based on the discussion and e-mails following amendments were made in the technical specifications.

S. No.	Technical Specifications	Changes desired by the vendors	Amended Specifications
Amendments desired by M/s. NETZSCH Technologies India Pvt. Ltd.			
1.	Point No. 12: Mass spectrometer Sub-point: 8 The GC-MS shall be equipped with a temperature-controlled heated ion source and heated quadrupole to minimize contamination on the surface.	The GC-MS shall be equipped with a temperature controlled heated ion source and heated quadrupole <u>or equivalent technology</u> to minimize contamination on the surface.	The GC-MS shall be equipped with a temperature controlled heated ion source and heated quadrupole or equivalent technology to minimize contamination on the surface.
2.	Point No. 22: Qualification criteria <ul style="list-style-type: none"> • Vendor should furnish evidence of supply, installation and commissioning of at least one GC-MS with pyrolyzer (Py-GC-MS) in last five years in Indian Central and State Government Organizations/PSU/Academic and Research organizations, PO and contact details of the users to be provided. • At least one documentary evidence for the confirmation of coupling of NETZSCH STA with the quoted GC/GC-MS. 	Vendor should furnish evidence of supply, installation and commissioning of at least one GC-MS with pyrolyzer (Py-GC-MS) in last five years in Indian Central and State Government Organizations/PSU/ Academic and Research organizations, PO and contact details of the users to be provided <u>either by supplier or OEM of GC-MS.</u>	<ul style="list-style-type: none"> • Vendor should furnish evidence of supply, installation and commissioning of at least one GC-MS with pyrolyzer (Py-GC-MS) in last five years in Indian Central and State Government Organizations/PSU/Academic and Research organizations, PO and contact details of the users to be provided either by supplier or OEM of GC-MS. • At least one documentary evidence for the confirmation of coupling of NETZSCH STA with the quoted MS/GC-MS.
Amendments desired by M/s. Agilent Technologies India Pvt. Ltd.			
3.	Point No. 21 Sub-point: 2 The institute shall provide air-conditioned room with table and required electric power outlet	A suitable vibration-free table capable of accommodating the complete system must be supplied.	Appropriate vibration free table to be provided to place the entire system including TGA-DSC, Valve box and GC-MS in a single table.



4.	Point No. 18 13 kVA or appropriate UPS with 60 minutes backup to be provided.	A UPS of at least 15 kVA capacity must be supplied with the system.	15 kVA or appropriate UPS with 60 minutes backup to be provided.
5.	Point No. 14 Sub-heading: 2 Standards for pyrolyzer	The standards required for the pyrolyzer must be supplied as specified in the tender, <u>or equivalent standards</u> may be accepted as recommended by the OEM of the pyrolyzer unit.	10 gm of Poly styrene trimer (SSS) and methyl stearate (Me-Ste added as internal standard) or equivalent standard to be provided for pyrolyzer calibration. Accordingly point no. 7 is also modified as follows: System reproducibility: 2%(RSD) or less with respect to reference materials (Polystyrene trimer (SSS) and methyl stearate (added as internal standard) or equivalent standard).
6.	Point No. 16 Sub-heading: 2 Sub-point: 4 Spare Filaments: 01	One additional filament can be included in the GC-MS consumables.	Spare Filaments: 02
7.	Point No. 16 Sub-heading: 2 Sub-point: 1 For GC-MS: Gas Cylinders: He: 2 Nos. H ₂ : 1 No.	Hydrogen gas should be supplied only if required for the proposed system configuration or application. It is not required from us.	Gas Cylinders He: 2 Nos. H ₂ : 1 No (<u>if required</u>).
8.	Point No. 16 Sub-heading: 2 Sub-point: 2 Calibration cylinder (mixture of SO ₂ , CO ₂ , CO)	The tender mentions a calibrant gas, while OFN and PFTBA have already been specified. Therefore, an additional calibrant gas may not be required. However, if it is required, please specify the cylinder size, calibrant concentration and balance gas.	The calibration cylinder (mixture of SO ₂ , CO ₂ , CO) is removed.
9.	Point No. 20 Gas lines and cylinders	Additional gas cylinders required for the operation of the TGA must be separately quoted. Please mention the gases and panels if you need them.	Supply of UHP Helium cylinders, and UHP Hydrogen cylinders (if required), each having a capacity of ≥ 200 cf, with compatible dual-stage stainless-steel regulators, <u>stainless-steel gas distribution lines for both GC-MS and for TGA-DSC (N₂ and O₂)</u> with proper fixing and mounting, isolation valves, leak-proof fittings, and all necessary accessories for complete installation of the system.
Amendments desired by M/s Thermo Fisher Scientific India Pvt. Ltd., through e-mail			

10.	Point No. 12 Sub-point: 6 Instrument detection limit: 10 fg or better with OFN injections	Instrument detection limit: 3 fg or better with OFN injections	The specification was not amended as 3fg fall within the desired limit.
11.	Point No. 12 Sub-point: 3 Detectable mass range: m/z 1 to m/z 1000 or wider	Detectable mass range: m/z 1.2 to m/z 1000 or wider	Detectable mass range: m/z 1.5 to m/z 1000 or wider
12.	Point No. 12 Sub-point: 8 The GC-MS shall be equipped with a temperature-controlled heated ion source and heated quadrupole to minimize contamination on the surface.	The GC-MS shall be equipped with a temperature controlled heated ion source and heated quadrupole <u>or equivalent technique</u> to minimize contamination on the surface.	The GC-MS shall be equipped with a temperature controlled heated ion source and heated quadrupole or equivalent technology to minimize contamination on the surface.
13.	Point No. 05	Should be a double shot pyrolyzer.	We intend to analyse various polymers, small molecules, industrial waste, micro plastics, etc., which are R&D samples. So multi-shot pyrolyzer is required to analyse various type of samples developed by CSIR-AMPRI, Bhopal. Hence, the specification was not amended.

Apart from the above points mentioned by the vendors, following points were discussed during the meeting and desired to amend

14.	Point No. 13 Vacuum System	The vacuum system specifications may vary depending on the quoted GC-MS model/manufacturer.	Vacuum system which is compatible with the quoted system.
15.	Point No. 16 Sub-heading: 2 Sub-point: 12 Syringes of 1 µL, 5µL, 10µL	It was suggested that 1 µL syringe is not required for intended application.	As it is a consumable: Syringes of 1 µL was removed.

Rest of the specifications will remain unchanged.

Annexure I

Procurement of Gas Chromatography-Mass Spectrometry (GC-MS) and integrating it with existing NETZSCH STA 449 F5 Jupiter system for evolved gas analysis

S.No.	Furnace adapter, transfer line and valve box for existing NETZSCH STA 449 F5 Jupiter System	
1.	Heated furnace adapter	<ul style="list-style-type: none"> • Temperature: Variable from 100°C - 400°C to avoid condensation. • Temperature controller along with display to be provided. • To be compatible with NETZSCH STA 449 F5 Jupiter System
2.	Heated transfer line	<ul style="list-style-type: none"> • Temperature: 100 °C - 350°C • TRG multi-channel temperature controller/equivalent to be provided. • Length of transfer line: $\geq 1.5\text{m}$ • Material: Glass-lined steel pipe/equivalent • To be compatible with NETZSCH STA 449 F5 Jupiter System.
3.	Valve system with sample loop	<ul style="list-style-type: none"> • Heatable up to: 100°C - 350°C or more • Sampling loops of suitable volume: 250μL & 500μL (both). • To be compatible with existing NETZSCH STA 449 F5 Jupiter System
4.	The furnace adapter, transfer line and valve box to be fully compatible with the Netzsch STA 449 F5 Jupiter, which is available at CSIR-AMPRI, Bhopal, M.P.	
	Pyrolyzer	
5.	Furnace	<ul style="list-style-type: none"> • Heated pyrolysis system capable of rapid, uniform, and reproducible sample heating to be provided. • Pyrolyzer tube/cup: Quartz/equivalent material to introduce the sample, which can withstand thermal shock, chemical inertness and high temperature. • Operating temperature: RT + 10 °C till 1050°C or wider • Temperature stability/accuracy: $\pm 0.1^\circ\text{C}$ • Heating Rate: 1– 600 °C/min or wider • The furnace should permit rapid introduction of the sample into the preheated pyrolysis zone by a sample drop or equivalent mechanism to ensure instantaneous heating and reproducible flash pyrolysis. • Furnace should be designed with built-in cooling facility.
6.	Interface/Adapter	<ul style="list-style-type: none"> • Temperature control range: variable from 40 - 450°C or wider • Stability/Accuracy: $\pm 0.1^\circ\text{C}$
7.	System reproducibility	<ul style="list-style-type: none"> • 2% (RSD) or less with respect to reference materials (Polystyrene trimer (SSS) and methyl stearate (added as internal standard) or equivalent standard).
8.	Additional features	<ul style="list-style-type: none"> • Should be capable performing selective thermal zone analysis. • Pyrolyzer should be software-controlled and capable of controlling temperature, heating rate of both furnace and interface/adapter, etc. • Liquid N₂ trap to be provided to traps volatiles that are having low boiling point. • To be compatible with GC Carrier gases like H₂, He, etc.
	Gas Chromatograph-Mass Spectrometer	

9.	Injector/Inlet	<ul style="list-style-type: none"> • Two inlets to be provided, one dedicated for coupling TGA and another for Pyrolyzer/liquid sample introduction. • Controllable up to 400°C or better • Split and splitless capillary inlet to be provided for handling both concentrated and trace-level samples. • Variable split ratio: 12000:1 or better
10.	GC column oven	<ul style="list-style-type: none"> • Temperature range: RT + 5 °C to 450°C or wider • Temperature set point resolution: 0.1°C • Maximum heating rate: 120°C/min or higher • Maximum ramps/steps: 20 or more • It should be capable of accommodating two capillary columns: one of 30 m × 0.25 mm ID with stationary phase 5% phenyl-95% dimethylpolysiloxane and another of 30 m × 0.32 mm ID with porous solid stationary phase (or equivalent). • GC oven should support cryogenic cooling using liquid CO₂ or liquid nitrogen, enabling separation of highly volatile analytes.
11.	GC column	<ul style="list-style-type: none"> • Compatible with carrier gases like Helium and Hydrogen. • Carrier gas flow controller: Electronic Pneumatic Control (EPC) or Mass Flow Controller (MFC). • Retention time repeatability: ≤ 0.0008min or less • Peak area repeatability: ≤ 1%RSD or less • It should be capable of removing high-boiling or late-eluting compounds to protect column. <p><u>Properties of column</u></p> <ul style="list-style-type: none"> • Column 1 <ol style="list-style-type: none"> 1. Column should be made up of fused silica or equivalent. 2. Column length: 30 m, ID: 0.25 mm, thickness of stationary phase: 0.25 µm or similar that is compatible with the system. 3. Stationary phases: 5% phenyl-95% dimethylpolysiloxane • Column 2 <ol style="list-style-type: none"> 1. Column length: 30 m, ID: 0.32 mm or similar that is compatible with the system. 2. Porous column or equivalent, suitable for separation of permanent gases, hydrocarbons, alcohols, aldehydes, ketones, CO₂.
12.	Mass spectrometer	<ul style="list-style-type: none"> • Ionization source: Electron Ionization (EI) • Ionisation energy: Capable of ionizing at 70eV as per NIST library. • Detectable mass range: m/z 1.5 to m/z 1000 or wider • Scan rates: ≈20000 amu/s or better • Sensitivity (EI Scan (S/N)): 2000:1 or more for 1pg of OFN (octafluoronaphthalene) • Instrument detection limit: 10 fg or better with OFN injections • The GC-MS should have a precision-engineered quadrupole mass analyser with optimized ion optics to provide high sensitivity, low background noise, excellent mass stability, and unit mass resolution across the specified mass range.

		<ul style="list-style-type: none"> • The GC-MS shall be equipped with a temperature-controlled heated ion source and heated quadrupole or equivalent technology to minimize contamination on the surface. • Filament: Long-life, high-stability EI filament • Detector: Electron multiplier • The GC-MS should be capable of performing full scan as well as Selected Ion Monitoring (SIM).
13.	Vacuum system which is compatible with the quoted system.	<ul style="list-style-type: none"> • It should be equipped with a high-vacuum turbomolecular pump and a compatible backing pump. • The backing pump should be an oil-free dry scroll pump to minimize maintenance and eliminate oil contamination. • Turbo-Pump Ultimate Vacuum: $<1 \times 10^{-6}$ mbar or better, which is suitable for the quoted mass spectrometer. Pumping Speed: ≥ 190 L/s (He) or more
14.	Standards	<p><u>Standards for GC-MS:</u> Should be provided with all certified reference materials, calibration standards, performance qualification standards, GC-MS tuning standards, and associated protocols required for verification of all quoted instrument specifications.</p> <ol style="list-style-type: none"> 1. MS tuning standards: PFTBA (Perfluorotributylamine) 2. Performance standard: OFN (Octafluoronaphthalene) <p>The instrument should include all hardware and accessories required for introduction of the tuning/calibration standard and routine mass calibration.</p> <p><u>Standards for Pyrolyzer:</u></p> <ol style="list-style-type: none"> 1. 10 gm of Poly styrene trimer (SSS) and methyl stearate (Me-Ste added as internal standard) or equivalent standard to be provided for pyrolyzer calibration.
15.		
16.	Other essential requirements	<p><u>For Pyrolyzer:</u></p> <ol style="list-style-type: none"> 1. Spare quartz pyrolysis tube: 2 No. 2. Double-shot sampler along with stand: 1 No. 3. Interface connection & connection accessories: 1 No. each 4. Appropriate sample holder/ sample cups/sample tubes compatible with the supplied pyrolyzer shall be provided in suitable sizes: 50 Nos. 5. Sample holder tool: 10 Nos. 6. Graphite Vespel ferrule or equivalent: 5 Nos. 7. Liquid sampler: 1 No. 8. Septum: 5 Nos. 9. Appropriate microliter syringes: 10 Nos. 10. Library: Evolved gas analysis library, Polymer library, Pyrolyzates Library, Additive library to be provided. <p><u>For GC-MS</u></p> <ol style="list-style-type: none"> 1. Gas Cylinders He: 2 Nos. H₂: 1 No (if required). 2. Latest edition of NIST Library to be provided 3. Spare filaments: 2 No

		4. Spare column: 1 set 5. Consumables, tubings, kits etc for complete installation 6. Septa: 20 Nos 7. Ferules: 10 Nos 8. Liner: 10 Nos 9. Column Nuts: 4 No. 10. MS Column Nuts: 4 No. 11. Syringes of 5 μ L, 10 μ L (if available): 2 Nos. each. 12. O-rings for inlet maintenance 13. GC-MS Tool Kit 14. Vacuum Pump Fluid: 1 Pack (if required) 15. Crucibles of TGA-DSC for trial runs Alumina: 20 (5 lids) Platinum: 10 (5 lids)
17.	Computer	Appropriate PC with 27inch monitor, with licensed operating systems, 32 GB RAM, 2 TB SSD/Hard disc, with licensed MS office 2024 or equivalent computer/workstation to be provided which is suitable for the GC-MS.
18.	UPS	15 kVA or appropriate UPS with 60 minutes backup to be provided.
19.	Warranty	<ul style="list-style-type: none"> • Minimum 1-year warranty for the entire system from the date of successful installation and commissioning. • AMC charges for the entire system after warranty period to be quoted separately for three years.
20.	Gas lines and cylinders	<ul style="list-style-type: none"> • Supply of UHP Helium cylinders, and UHP Hydrogen cylinders (if required), each having a capacity of ≥ 200 cf, with compatible dual-stage stainless-steel regulators, stainless-steel gas distribution lines for both GC-MS and for TGA-DSC (N_2 and O_2) with proper fixing and mounting, isolation valves, leak-proof fittings, and all necessary accessories for complete installation of the system.
21.	Others	<ul style="list-style-type: none"> • Pre installation requirements: The supplier shall furnish complete technical details of all pre-installation requirements within two weeks of receipt of PO. • The institute shall provide air-conditioned room and required electrical power outlet. • Appropriate vibration free table to be provided to place the entire system including TGA-DSC, Valve box and GC-MS in a single table. • The supplier shall be responsible for supplying all other accessories, utilities, and ancillary items necessary for the loading, unloading, installation, commissioning, calibration (if applicable), and smooth operation of the equipment. • Suitable tool kit, spares and consumables kit is to be included. • Comprehensive on-site training should be provided about the operation, maintenance, method development, troubleshooting, and data analysis of the TGA-GC-MS/Py-GC-MS system. Training shall include evolved gas analysis (EGA), pyrolysis analysis, for different sample matrices, including polymers, composites, industrial waste, environmental samples, and other relevant materials. Users to be trained onsite for about a week.

22.	Qualification criteria	<ul style="list-style-type: none"> • Vendor should furnish evidence of supply, installation and commissioning of at least one GC-MS with pyrolyzer (Py-GC-MS) in last five years in Indian Central and State Government Organizations/PSU/Academic and Research organizations, PO and contact details of the users to be provided either by supplier or OEM of GC-MS. • At least one documentary evidence for the confirmation of coupling of NETZSCH STA with the quoted MS/GC-MS
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 06.10.26