

Technical Specification for Gas Chromatography – Mass Spectrometer

Sl. No	Component	Specification
1	Vendor eligibility criteria	<ol style="list-style-type: none"> 1. A list of at least 3 Institutions/R&D units/Industries where similar instruments have been supplied in India, including contact details (name of the person-in-charge, email, and phone number), should be provided. 2. The quoted model's three performance certificates in reputed institutions in India should be enclosed duly signed and stamped by the concerned scientist.
2	Warranty	Minimum 3 years warranty with 2 years free service
3	General	<p>System should be designed and manufactured under ISO-9001. The chromatography data system should be based on Microsoft Windows operating system for instrument control, data acquisition and data analysis.</p> <ol style="list-style-type: none"> 1. Must be able to configurable at least 2 inlets, 3 detectors 2. Retention time repeatability should be < 0.0008 min and Peak area repeatability < 1 % RSD. 3. Integrated leak check function allows you to easily check for leaks and extensive self-diagnosis function with safety features. 4. Should perform automated baseline check and user defined system suitability test in a sequence for standard detectors.
4	Column Oven	<ol style="list-style-type: none"> 1. Minimum two suitable capillary columns. 2. Temp. Range: Ambient + 4 to 450°C. 3. Ramp rate: maximum 100°C/min or more. 4. Cooling rate: 450°C to 50°C within 4 min or better with optional cooling ramps. 5. Built-in oven light that facilitates column installation should be available. 6. Should have oven power safety (power off when door is open)
5	Split/Splitless injector port – 1 No	<ol style="list-style-type: none"> 1. Split/split less capillary inlet. 2. Maximum temperature: 450°C 3. Split ratio: 6000:1 or more. 4. Pressure setting range 0 – 150 psi with control of 0.001 psi for whole range. 5. Carrier gas Flow Control should have Constant flow, constant pressure. 6. Pressure program ramps: Minimum 5 steps.

6	Detector - FID	<ol style="list-style-type: none"> 1. Minimum detection level should be around 1.2 pgC/s for dodecane or equivalent compound. 2. Temperature range of up to 450°C. 3. Able to automatically control up to 3 channels of gas, i.e. H₂, make-up and Zero grade Air. 4. Must have an acquisition time of 2 ms (300Hz) or better 5. Must provide fast flame out detection and efficient automatic re-ignition. 6. Dynamic range should be up to 10⁷
7	Auto Injector	<ol style="list-style-type: none"> 1. Automated liquid sampler with 150 Vials capacity. 2. Should able to inject sample volume 1 to 80% of syringe capacity or better
8	Single Quadruple Mass Spectrometer	<ol style="list-style-type: none"> 1. Ionization modes: EI & System should have dual filament design with automatic switching. 2. Ion Source temperature: upto 350°C. 3. Electron energy range upto 150 eV or better. 4. Mass Range: 1.5 to 1000 amu or better. 5. Mass analyzer: Quadruple should be of solid metal, with pre- rods for matrix elimination or equivalent. 6. Vacuum pump: Dual inlet/stage Turbomolecular pump (>250 L/s) Ionization. 7. Mass axis stability: ±0.1 amu over 48 hours. 8. Mass resolution: Unit mass. 9. Detector: Sealed long-life electron multiplier tube. 10. Scan rate: 20,000 amu/s or better and should retain sensitivity for all higher scan rate acquisition. 11. EI Scan sensitivity: 2000:1 for 1pg of OFN for the mass m/z 272 using 30 m column
9	Software	<ol style="list-style-type: none"> 1. Suitable software for performing data analyses, calibration, blank correction, data import, export, handling and reporting. 2. Must be able to review quantitative peak identification in a single environment that includes quantitation tables, calibration curves, raw spectra, background subtracted spectra, ratios plots etc. 3. Must have built-in reporting functionality to generate industry-standard reports with the ability to customize report templates as necessary. 4. Automatically create SIM from acquired Scan data and optimizing tool for SIM group creation with dwell time for better repeatability and peak profile. 5. Instrument acquisition, acquired data analysis and reporting should have be built based on the Retention indices through automated features.

10	Database and software	NIST 2020 library with license, Library data base in CD ROM should be provided
11	Capillary Columns	<ol style="list-style-type: none"> 1. The following capillary columns must be provided along with the system. 2. HP5-ms/DB5-ms or equivalent 3. Zebron 5-HT or equivalent 4. Heliflex® ATT-35ms (or equivalent) 5. Heliflex® ATT-5ms or equivalent
12	Computer	The PC should meet the minimum requirements such as desktop with thei-5 processor, 8 GB RAM, 1 TB, Windows 10 or better, and 28 inches or more LED monitor.
13	Accessories required	<ol style="list-style-type: none"> 1. Gas cylinders for Carrier gas and detector gas should be provided. 2. Two stage Cylinder Regulator with Brass Chrome plated body with S.S. Diaphragm for Carrier gas and Collision gas, should be included. 3. Suitable Gas Purification & Control Panel with pressure Regulator for Carrier gas and Collision gas should be provided