



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076.

PR No. 100035242 (RFx No. 6100001526)

Detailed Technical Specifications for Gas Chromatograph

Pre-Qualification Criteria

- Bidder will submit other certificates - ISO 9001 and full compliance with international regulatory, safety, and electromagnetic compatibility requirements.
- Bidder has to provide proof of at least 3 similar jobs in the last 5 years for any government institute.
- Bidder has to upload the GC flow diagram/ configuration in the bid.

Technical Specifications for Gas Chromatograph

Sr. No.	Specifications
	<p><u>Brief:</u> Automatic, computer-controlled Gas Chromatograph Analyser with TCD (Thermal Conductivity Detector) and FID (Flame Ionization Detector) required for analysis of gaseous mixture containing permanent gases H₂, CO, CO₂, O₂, N₂ and C₁ to C₁₀ hydrocarbons.</p> <p>Channel 1 should be with suitable GSV (Gas Sampling Valve), pre-column, main column and TCD for analysing above permanent gases. Pre-column backflush technique should be incorporated to avoid heavier in main column. Proper separation of N₂ and CO should be achieved even if N₂ concentration of 70%.</p> <p>Channel 2 should be with suitable capillary column and FID to facilitate hydrocarbons analysis from C₁ to C₁₀ in the same gaseous sample.</p> <p>The scope of supply consists of delivery of the system to the laboratory at IIT Bombay, installation, commissioning, training of system at IIT Bombay laboratory. System to be supplied with method set up parameters, plumbing diagram, and schematics from factory.</p> <p>Below are minimum specifications required for the Gas chromatograph system.</p>
A.	Gas Chromatograph
1.	GC Large Graphical LCD based display to view real time Chromatogram and their Parameters such as temperature sensors and carrier gas supply pressure.
	An automatic computer controlled dual channel gas chromatographic system, capillary/ packed columns, oven, flow control systems, FID, TCD, gas sampling valves with appropriate loops & fittings, and powerful and versatile software capable of analysing gases / liquid is required. The Valves must be factory fitted only in the dedicated option box.
	Should be capable of mounting 3 injectors and 4 Detectors.
	Should be equipped with Intelligent self-diagnostic functions for detailed diagnosis of the septum, glass insert usage status,

		temperature sensor error, gas supply pressure, status of each gas ignition function etc.
		Should be manufactured as per ISO 9001 and in full compliance with international regulatory, safety, and electromagnetic compatibility requirements
2	Column Oven	
	Capacity	Minimum 15L or above
	Temperature Range	Ambient + 10 °C to 400 °C
	Temperature Program ramps	Minimum 20 or more
	Max temperature program rate	Minimum 60°C/min or more
	Cooling time	300 °C to 50 °C within 6 min (at 25 °C ambient temperature) or faster
	Maximum run time	At least 9999 min or more
3	Automatic Gas Sampling Valves	Factory fitted 6 or 8 port gas sampling valves (Valco make only) –for gas samples analysis. PI submit the Plumbing diagram
4	Thermal Conductivity Detector (TCD)	
	Max Operating temperature	400 °C or more
	Sensitivity	200 pg tri-decane/mL or <10 microvolt per ppm or >4000mV x mL/mg (Decane)
	Dynamic range	10 ⁵ or better
5	Flame Ionization Detector (FID)	
	Max Operating temperature	400°C or more
	Minimum detectable quantity -MDQ	3 pg C/s (Dodecane) or better
	Dynamic range	10 ⁷ or better
6	Sample Injector port	Suitable sample injection ports to introduce sample through gas tight syringe.
7	Automatic Gas Flow / Pressure Controller	Automatically compensates for variations in atmospheric pressure and temperature
	Pressure range	0 to 140 psi
	Pressure program ramps	Minimum 7 or more
8	Software	64-/32-bit Windows 10 compatible workstation software with minimum 4 Channel to be quoted of same make - Multi channel real time chromatographic data acquisition and post-run analysis should be possible. - Software should be with high-speed data acquisition and bulk analysis compatibility - Full qualitative & quantitative processing functions, multi-function compatibility, GLP/GMP functions, Audit Trail, Validation Assistant, Column Performance function, System Suitability, QA/QC functions - All in-one file configuration for easy data, transfer, customized report generator, networking capability, data management etc.
9	Columns	Suitable packed & capillary columns set for analysis of H2, O2, N2, CO, CO2 and C1 -C10 should be included.

		Compound	Low Conc.	High Conc.
		H2	0.01%	80%
		O2+N2	0.01%	70%
		CO	0.01%	25%
		CO2	0.01%	80%
		CH4	0.01%	90%
		C2 – C10	1 ppm	10%
10	Other items	Suitable sample loop, gas supply pipes & OEM make filter kit should be included.		
B	PC system & Online UPS	Suitable branded PC system for GC software should be offered. Branded 5KVA online UPS with 30min backup should be offered.		
C	Printer	Suitable branded printer should be offered		
D	Calibration Cylinder with regulator	Suitable calibration gas blend containing H2, O2, N2, CO, CO2 and C1 to C6 should be provided in 10L capacity cylinder with suitable regulator.		
E	Warranty	12 months from date of installation.		
F	Installation & training	Installation of the instrument to be done at IIT Bombay campus, at free of cost. Operational training to be provided to respective group of research fellows.		