



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

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**Detailed Technical Specifications for HPLC with Diode Array Detector
and Fluorescence Detector**

I. The HPLC system should comprise of the following components:

- A. 1. Solvent Delivery System (Pump)
- B. 2. Auto sampler
- C. 3. Column Oven
- D. 4. Photo Diode Array Detector
- E. 5. Fluorescence Detector
- F. 6. Chromatographic Software
- G. 7. PC & Printer
- H. 8. UPS

Below are the minimum required specifications for each of the individual modules and all modules should be compatible with each other.

A. Solvent Delivery system (Pump):

- 1. The pump should provide error-free programming of pump parameters including flow rates, operating pressure limits, compressibility compensation, calibration and diagnostic.
- 2. It should be capable of operating with 2 or more solvents at a time during gradient operation limits, compressibility compensation, calibration and diagnostics.
- 3. It should have an adjustable flow rate range from 0.001 to 5 mL/min, in 0.001 mL/min increments.
- 4. Must have an operating pressure range of 0 - 400 bar.
- 5. Flow rate accuracy should be $\pm 1\%$ or $\pm 2 \mu\text{l}/\text{min}$ of the set value or better.
- 6. Flow rate precision should be $\pm 0.07\%$ RSD or better.
- 7. The precision in composition must be within 0.2% RSD.
- 8. The system should have at least 4 solvent bottles complete with fittings.
- 9. It should incorporate degassing unit with at least 4 flow lines.
- 10. It should allow for module-wise and system-wise upgradation capability in future.

B. Auto sampler:

- 1. The Auto sampler must have a capacity to hold at least 96 standard size autosampler vials

2. It should allow sample injection volume in the range of 0.1 µl to 100 µl.
3. Carry over should be less than 0.005%.
4. The injection precision should be within 0.3% of RSD.
5. It should have both flow line/needle rinse capability both before and after sampling.

C. Column Compartment:

1. The Column Compartment should be thermostatic with heating up to 65°C
2. At least two columns up to 250 mm should be accommodated.
3. Two HPLC columns together with guard columns for analysis of polynuclear aromatic hydrocarbons (PAHs) and pharmaceuticals, respectively, should be provided.

D. Photodiode Array (PDA) Detector:

1. The wavelength range should be 190 nm - 800 nm or more.
2. The photo-diode array detector should have 1024 elements.
3. The wavelength range of 190-800 nm must be covered with a deuterium lamp [D2] or with a combination of deuterium lamp [D2] and a tungsten lamp [W] provided as light Source.
4. Wavelength accuracy should be within ± 1 nm.
5. A standard flow cell of 12-13 micro-L volume, 10 mm path length and 12 MPa should be available.
6. The detector should have variable slit width for high resolution as well as high sensitivity.
7. The Drift should be 0.9×10^{-3} AU/h or less.
8. The Noise should be 0.7×10^{-5} AU or less.
9. Linearity should be equal or more than 2 AU.

E. Fluorescence Detector:

1. The light source of fluorescence detector should be a Xenon lamp.
2. The wavelength range should be 200 nm to 650 nm or more.
3. Wavelength accuracy should be at least ± 3 nm.
4. Wavelength reproducibility/repeatability should be ± 0.2 nm.
5. Raman peak signal to noise should be 1000 or more.

F. Chromatographic Software:

1. Genuine and compliant chromatographic software should be supplied with the HPLC system. The latest version of software should be provided.

2. The software should be genuine & original.
3. It should allow full control of the instrument together with the detectors.

G. PC and Printer

1. PC along with latest configuration with LCD/LED monitor, optical mouse and key board should be supplied together with a laser printer

H. **UPS** for avoiding power fluctuations should be provided with the system. UPS should provide 60 min backup power.

I. **All the necessary accessories** for smooth operation of the system should be provided, such as: kits with stainless steel capillaries, PEEK tubing and fittings, cutter, PTFE frits, solvent inlet filter; tool kits & other accessories.

II. Eligibility Criteria

1. The vendor must be reputed and must have experience of at least 10 years for supply of HPLC with the quoted Detectors. They must have more than 50 installations in India. Preferably they should have their own facility to provide demo / training on similar instrument. Vendor must have service as well as application engineers based in Mumbai.

III. Service, Warranty and Training

1. The quote should include delivery, installation, commissioning and training (at least 4 users)
2. Warranty for the complete system (including all components) for a period of 3 years from date of installation should be provided at no extra cost for parts, repair, and service engineer.
3. Vendor to provide service guarantee. Should the system require service during the warranty period, the vendor must guarantee turn-around-time within 24 hours
4. Vendor must provide a site-preparation checklist
5. Vendor must demonstrate that it has a proven appropriate set-up and capability to provide after-sales service efficiently and effectively. The supplier should have in his facility a similar system to that proposed in this tender for training purpose
6. The system should be robust to voltage fluctuations and should be capable of operating at earth to neutral voltage less than 3 V.

IV. AMC for the complete system for a period of 3 years beyond the warranty period.

1. AMC for 4th Year
2. AMC for 5th Year
3. **AMC for 6th Year**