



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

Ref No. (PR No. 1000034407)

(Rfx No. 6100001469)

Technical Specification for FTIR Spectrometer

FTIR Spectrometer (Qty-1 No.)

1. The instrument spectral resolution should be continuously variable to maximum optical retardation of at least 2 cm⁻¹
2. **Optics: The standard spectral operating range should be no less than 6000 - 500 cm⁻¹ with High Humidity Resistance ZnSe optics.**
3. Weight for the basic spectrometer without Universal Sample holder must be below 10 kg and it should be portable.
4. **Spectrometer:** components like source, laser, detector, and interferometer must be continuously monitored for operation within factory specifications. The operator must be immediately notified by system software if any of the factory specifications are not met. The software must offer detailed information about the nature of the failure and suggest possible remedy.
5. **Signal to Noise** ratio should be > 55000: 1
6. **Optical** components like detector and source must be electronically coded, so that these components are automatically recognized when placed in the spectrometer. Appropriate parameter must be automatically transferred to the application software.
7. **Detector** shall comprise of High Sensitivity temperature controlled **DLaTGS**-detector with high stability against external temperature changes
8. **Optics** should be completely sealed and desiccated with protective Gold coating on the mirror to get high efficiency in Mid –IR spectral range to work smoothly
9. **Accessories:**

- a) Sampling modules such as ATR with Diamond crystal along with temperature control (monolithic) for analysing Liquid, Paste, Gel shall be provided **Synthetic diamond crystal will not be acceptable.**
10. **Sampling modules** must be automatically identified and spectral test routines must automatically start to verify accessory performance.
 11. The FTIR must incorporate a high throughput 60-degree interferometer and Gold Coated optics for maximum light throughput.
 12. The **Interferometer** must be permanently aligned. Interferometer design. System that require alignment (either manual or automatic) are not acceptable.
 13. The **Interferometer bearing mechanism** must be wear-free (frictionless) design to ensure unlimited lifetime. Bearings with wear are not acceptable as they require frequent maintenance and costly exchange.
 14. The **Interferometer** must utilize retro reflecting gold coated cube corners for instantaneous correction of instability due to mirror tilt.
 15. The system must include a replacement desiccant.
 16. The system must incorporate an automated internal instrument validation unit. The internal validation unit must be able to incorporate different validation standards and be fully software controlled. This instrument validation must not require user interaction and must produce a report documenting the results of the validation tests.
 17. System should perform automatic performance test routine for operational and performance qualification (**OQ, PQ**) using internal standard /reference material.
 18. Communication between the spectrometer and controlling PC must be performed using an Ethernet protocol.
 19. The system must be able to be controlled by a laptop or PC computer.
 20. FTIR should be Upgradable to connect with Microscope in Future.
 21. The Interferometer, **Laser should carry 10 Years warranty and IR Source for 5 Years.**
 22. **SOFTWARE specifications:**
 - a) The software must be "all-in-one" software for data measurement, manipulation and evaluation.
 - b) The software must come with a step-by-step assistant.
 - c) The software must include search capabilities as well as the possibility to create user own libraries.
 - d) The software must come with a free starter library.

- e) The software must come with a quantification tool.
- f) The software must come with an easy-to-use graphical macro editor.
- g) The software must include an automatic instrument test (OQ/PQ).
- h) The software must allow multi level user management.
- i) The software must be GMP/GLP conform.

23. Spectrometer power: 100 - 240 VAC, 50 - 60 Hz, 20 W (low energy consumption)

24. Installation shall be carried out by the trained Service Personnel at Site.

25. Training shall be imparted to our training staff for min 2 days.

26. End User Statement has to be provided.