



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

Ref. PR No. 1000051187

Rfx. No. 6100002520

Item Description –Portable Raman Spectrometer (QTY : 01 No.)

Sr. No	Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	The system must have a 785 nm laser source with CleanLaze® technology, providing better than 1cm^{-1} stability over the full range of adjustable output power.		
2.	The system must have a video microscope sampling system for use with Raman probe and should have a 20x objective at a working distance of 16 mm and manual rough and fine adjustment on the X, Y, and Z axes, coaxial LED illuminator for target alignment.		
3.	The system must have a high quantum efficiency CCD array detector which is TE cooled upto -2°C .		
4.	The system must have a spectral resolution $<4.5\text{ cm}^{-1}$ @ 912nm with a range of 65-3350 cm^{-1} .		
5.	The system must be capable of making measurements down to 100 cm^{-1} .		
6.	The system must be operable between 0 to 35°C ambient temperature.		
7.	The system must have a CCD array detector thermoelectrically cooled to -2°C .		
8.	The system must have a fiber optic Raman probe.		

<p>9.</p> <p>10.</p> <p>11.</p> <p>12.</p> <p>13.</p> <p>14.</p> <p>15.</p> <p>16.</p> <p>17.</p> <p>18.</p> <p>19.</p> <p>20.</p>	<p>The instrument must have a Double Pass transmission f/2 spectrograph.</p> <p>The laser power of the system must be tunable in 1% steps with a full laser power of 340 mW at the probe output.</p> <p>The system should be compatible with USB 2.0 communications.</p> <p>The system must be equipped with a mechanical push trigger button at measurement probe for easy sampling.</p> <p>The fiber probe must have probe holder with an XYZ stage for sample positioning and focus adjustment.</p> <p>They system must have integration time between 100 ms-30 minutes.</p> <p>The fiber probe must have polystyrene reference sample that can be used for Raman Shift calibration and performance validation.</p> <p>The fiber probe must be compatible for an immersion shaft (shaft length customizable) that can be constructed from 316L SST, Hastelloy C-276 and shoule be available to have in future</p> <p>The fiber probe must be compatible for vial holder for sample measurement and vial holder shoule be available in future.</p> <p>The fiber probe must be compatible for cuvette holder for sample measurement and shoule be available in future.</p> <p>The OEM should have more than 27,000 spectral entries of chemicals, minerals, organic chemicals, solvents, polymers, dyes and pigments, TICs, TIMs, inorganics and organometallics, personal care products, and illicit material switch can be bought in future.</p> <p>The system should have compatibility and upgradability to use a video microscope objective with 100X &50X.</p>		
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21.	The system should be operable with an rechargeable battery in case if it is required in future.		
22.	<p>The system should be compatible to have a software in future that</p> <ul style="list-style-type: none"> a. Offers peak analysis options: center wavelength, peak height, peak area, FWHM, b. Offers real-time peak monitoring for up to 6 peaks or calculations based on them (i.e. peak ratios), c. Contains basic spectral math: addition, subtraction, multiplication, and division, Includes derivative algorithms: point difference, Savitzky-Golay, & differential, d. Includes smoothing algorithms: FFT, Savitzky-Golay, & boxcar, e. Features manual and automatic baseline correction, f. Saves the unprocessed sample and background spectra in pixels, as well the processed spectrum with both X and Y axes calibrated, g. Offers spectral file formats: txt, txtr, spc & csv, and Exports spectral files to Excel® 		
23.	<p>The system should be compatible to have a software in future that</p> <ul style="list-style-type: none"> a. can create identification, qualification, and quantitative analysis methods, b. can perform both real-time and off-line identification, qualification, and quantitative analysis, c. can perform Raman Shift calibration, d. can perform instrument performance validation, and e. is 21 CFR Part 11 compliant 		

24.	The system should be having compatability with the software that can perform both real-time and off-line identification using both commercial and user-created spectral libraries		
25.	Warranty : The instrument should be supplied with standard 1 year warranty		
26.	<p>The system shoule be upgradable in future with following Items :</p> <ul style="list-style-type: none"> a. External rechargeable battery pack for Field work-1 No. b. Vials for liquids, 15 mm in diameter Pack of 6 nos.: 1 No. c. Enclosure for Raman sampling system to eliminate direct ocular and/or skin exposure from the laser emission: 1 No. d. Zoom lens for fiber-optic Raman probes. Working distance is adjustable from 20 mm to 60 mm : 1 No. e. Long-working-distance zoom lens for fiber-optic Raman probes. Working distance is adjustable from 60 mm to 600 mm : 1 No. f. Carrying Case :1 No. g. Software for Quantification: 1 No. h. Software for Identification: 1 No. i. Comprehensive library: 1 No. j. Cuvette holder 12 mm X 12 mm for 9.5 mm probe: 1 No. k. Video microscope objective with 100X &50X 		