Specifications for Thermo optical characterization setup

Thermo optical characterization setup consists of Solar Spectrum Reflectometer & Emissometer which are intended for the measurement of optical & thermal properties like absorptance, reflectance, transmittance and emittance respectively of various thermal control materials for spacecraft application. The specifications of the setup are given below-

S. No.	Item	Description	Quantity
1.	**Solar Spectrum Reflectometer**	Table top Solar Spectrum Reflectometer with signal cable (approx. 6' long) & Black Body. (a) Reflectance Measurement: At an angle of 20 degrees from normal to the sample. It should provide accurate measurements on both diffuse and specular materials, even second surface reflectors up to 0.25 inches thick samples. (b) It should have selectable solar measurement spectrum that matches a variety of global and beam normal solar irradiances. (c) Indian Power Requirement: 240VAC, 50Hz with all necessary accessories (universal power supply, power cord etc.)	01
		Wavelength Range: 0.36 µm to 2.1µm	NA
		Resolution: 0.001 units	NA
		Repeatability: +/- 0.003 units.	NA
		Accuracy: +/- 0.002	NA
		Reflectance measurement head: measurement port of 1inch dia. (a) It should have detectors as UV, Blue, Red and IR indicating the primary wavelength range each cover. (b) Two additional virtual detectors are required by re-sampling the Red and IR detectors. (c) Drift: After warm-up, drift is less than +/- (1% of reading)/hour.	01
		Electronics module where reflectance or absorptance for one of the six individual detectors can also be displayed, data processing and storage to be done in data acquisition unit.	01
		Lamp: Plug in replaceable tungsten-halogen lamp. It should provide diffuse illumination at the sample port.	02
		Handle: Handle installed on side of measurement head	01
		Signal Cable as spare: approx. 6' long cable for connecting transmittance heads and reflectance measurement head to electronic package	02
		Transmittance Measurement Attachment: to measure Transmittance at angles from normal to 60 degrees off normal. Diffuse illumination of sample with 1.5 inch diameter port and transmitted energy to be measured with six detectors.	01

S. No.	Item	Description	Quantity
		Calibration Standards: NIST traceable diffuse, specular and spectral performance standards with calibration data programmed in electronic package and calibration certificates a) white ceramic tiles: 02 nos. b) mirror calibration: 01 no. c) spectral color tiles: 04 nos.	
		Carrying case: Suitable carrying case accommodating the electronics package, measurement head, cable, calibration standards, spare parts etc.	01
2.	**Emissometer**	Table top Emissometer for measuring hemispherical emittance with high emittance standards (02 nos.). Here detector of the instrument should be electrically heated so that the sample is not required to be heated. Indian Power Requirement: 240VAC, 50Hz with all necessary accessories (universal power supply, power cord etc.)	01
		Wavelength Range: 3.0µm to 30µm	NA
		Resolution: 0.01 units	NA
		Repeatability: ± 0.01 units	NA
		Accuracy: ± 0.02	NA
		Scaling Digital Voltmeter: 2.4 millivolts nominal, with sample emittance of 0.9 and sample temperature of 25C.	01
		Heat Sink: to be provided to keep both a calibration standard and the material to be measured at the same temperature	01
		Linearity: The detector output to be linear with emittance within + / - 0.01 units	NA
		Emissometer adapter to measure flat sample as small as 1.0 inches in diameter.	01
		Emissometer adapter to measure flat sample as small as 1.5 inches in diameter, materials with low thermal conductivity, cylindrical surfaces and rough or textured surfaces.	01
		Spare Parts: a) Low emittance standard with calibration certificate: 02 nos. b) Power/Output cable with universal power supply: 01 no.	-
		Carrying case: Suitable carrying case accommodating the electronics package, measurement head, cable, calibration standards, spare parts etc.	01

General Specifications:

- Machine shall be operated at 200-240 V / 50-60 Hz
- Machine shall be operated at surrounding temperature of 10°C - 40 °C and humidity level max. 80% Non-condensing
- High and low Emittance calibration standards with certificate shall be provided.
- The offer shall be for the complete setup as mentioned in our technical requirement, Part offers will not be considered.
- The equipment supplied shall be commissioned by supplier/manufacturer at free of cost at user's laboratory.
- The supplier has to provide catalogues/operating/instruction/service manuals/technical notes in English with individual specification/features of the instrument.
- The supplier has to provide authorization certificate from OEM, if not a manufacturer.
- The supplier has to demonstrate the performance of the equipment using reference samples and has to give necessary on-site training to URSC personnel after the installation and commissioning of the equipment at ISITE campus-URSC at free of cost.
- A warranty of minimum one year should be provided from the date of satisfactory installation.
- The manufacturer shall provide authorized certificate copy of the equipment being supplied that it is strictly complying/full compliance (partial compliance is not accepted) to the standards (ASTM C1549 for solar spectrum reflectometer, ASTM C1371 for emissometer)
- One-to One Compliance: The supplier shall provide one-to-one compliance table as per the technical specifications. The offer should be complete with compliance statement for each of the specifications, offering features, safety features and optional items. Indicating merely 'YES', 'NO', 'OK', or 'leaving blank' in the compliance statement will be liable to rejection.
- Delivery Period: 18 weeks from date of acceptance of PO.