

Appendix-I

Sr. No.	Name of the item with Specification	Qty.
1	<p data-bbox="304 286 777 315">ROTATIONAL VISCOMETER:</p> <p data-bbox="294 376 1271 517">Technical specification for rotational viscometer with automated and advance features for measuring viscosity of bitumen at different high temperatures, varying rpm, strain rate, stress etc. in accordance with ASTM D4402, AASHTO T 316</p> <p data-bbox="294 560 1271 701">The quote should include prices for all items (do not provide them in optional item) required for successful functional of this instrument. We are looking for a complete set of this instrument and ready to use once it is being installed. Provide the point-wise technical compliance table.</p> <p data-bbox="294 739 624 768">Technical Specification</p> <ul data-bbox="338 828 1271 1955" style="list-style-type: none"> • Capable of measuring the torque required to rotate the selected apparatus-measuring geometry (Spindle) at a selected constant speed (preferably rotational speed range 0.1 200 rpm or beyond) while submerged in asphalt/bitumen at constant desired test temperature, and with the capability to convert the torque measurement to viscosity in pascal seconds, millipascal seconds, or centipoise. • Capable of conducting test at different shear rate, shear stress, strain rate, torque etc through programmed software • With data logger software and all other necessary accessories, with wide range of viscosity. • Should include all types of spindles to be used for bitumen, temperature probe, software, spindle guard leg, carrying case for spindle and other accessories • Temperature-Controlled Thermal Chamber Heater (programmable temperature controller), for maintaining the sample of asphalt at the test temperature with an accuracy of 0.1°C. • Temperature Controller, capable of maintaining the specimen temperatures to ± 1.0 °C for test temperatures between 30 and 260°C or beyond. • Sample Chambers, reusable and disposable. • Platinum Resistance Thermometer (PRT), with a probe which conforms to the requirements of Specification E1137, for measuring the temperature of the thermal chamber. • Certified reference fluid, of known viscosity at various temperatures, for calibration of rotational viscometer. The reference fluid shall be certified to be Newtonian in behavior over the full range of expected test temperatures and shear rates. 	01

	<ul style="list-style-type: none"> • Sample stand/rack • Inbuilt software for automatically control and collect data, and analyze data, generate graph, change test types, shear rate, rpm etc • Personal computer with standard configuration, for easy functioning of the software and instrument • Timer to set time and date for automatic preheat • Cleaning accessories for sample tubes • Voltage: 240 V AC 50/60 Hz, single phase, • Include bitumen sample holder for measuring viscosity (100 quantity) • It should be Programmable, Multistep, Ramp • It should supplied with stand, boss head, spindle protection, spindle rack, carrying case, calibration Certificate, USB, cable, Data logger software and power supply cable. <p><u>Training and Installation</u></p> <ul style="list-style-type: none"> • Free instrument installation, demonstration and training to technical staff at IITRAM have to be provided • Instrument software CD, Calibration, installation manual and supporting documents. <p><u>Other Information</u></p> <ul style="list-style-type: none"> • Device should provide precise results and repeatable data • The device should have options to be upgradable in future for any requirement. So it should be options to change test parameters etc. • Give details of clients in India and abroad who has this system with complete contact information. 	
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