



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Technical Specifications

Ref No. (PR No. 1000050015)

(Rfx No. 6100002412)

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Equipment Description & Specifications

Tribometer, along with the compulsory attachments and accessories

S. No	Description
1.	Tribometer Floor Standing as per the details provided below:
2.	White Light Interferometer – 3D profilometer to be integrated with the following mentioned items

Technical Specifications

1.	Main Frame and Control System	<ul style="list-style-type: none"> Fully automated Automatic servo loading- No dead weight or pneumatic, no facility requirements Calibration should take a very short time/ Automatic Calibration Integrated white light profilometer- The sample can be analyzed at any point during the test to characterise surface wear vs. time. Comprehensive software for tribology and profilometer, including auto focus, auto stitching Linear load capabilities for scratch adhesion test Constant load tests for scratch hardness Linear wear tests High-speed high-torque drives for real-world simulations and samples Z travel distance up to 150mm, resolution 0.5µm or better 	Technical Compliance (yes/no)	Additional Information (if any)
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		<ul style="list-style-type: none"> • Servo-controlled loading, fully programmable • Travel speed: 0.002-5mm/s or better • In-situ wear-depth monitoring, Accuracy: 5 micrometres 		
2.	Down Force and Friction Force sensor with accessories	<ul style="list-style-type: none"> • <u>2 Dimensional Capacitive force sensor to measure downforce and friction force</u> • FZ Sensor Range: 0.5 to 200N FZ Sensor; Resolution 6mN or better • FX Sensor Range: 0.5 to 200N FX Sensor (Friction Sensor) or better, Resolution 2mN or better • Should have automatic servo control loading (no dead weight and pneumatic loading) 		
3.	Tribology Functional Modules	<p><u>Linear Reciprocating /XY Stage</u></p> <ul style="list-style-type: none"> • "X" Linear Reciprocating Drive: Speed 0.001-6mm/s (Medium/low load system), maximal travel: 130mm • "Y" Linear Reciprocating Drive: Speed 0.001-50mm/s with encoder, maximal travel: 270mm <p><u>Fast Linear - Reciprocating Drive</u></p> <ul style="list-style-type: none"> • Reciprocating Drive with Adjustable Stroke: 0.1-30mm • Frequency: 0.1-80Hz 		
4.	Holders and Consumables	<ul style="list-style-type: none"> • Holders and Consumables • Universal Ball Holder (1mm to 9.6mm), Pins holder to hold • Sample size up to 6.3mm. • Lower Sample Holder (for Reciprocating Drive) • Universal Lower Sample holder- Min 0.5", 		

		max 1.75" sample		
5	Lubricant Container	<ul style="list-style-type: none"> • Anti-Splash Brass Liquid Container to perform reciprocating test under lubricated conditions, it can work with a universal sample holder, which mounts on top of the universal sample holder. • Corrosion Chamber and Special Holder. 		
6.	Software and Control System	<ul style="list-style-type: none"> • All-in-one Desktop Computer and Software's • PC (Processor core - i7 (64 bit), 16 GB RAM, Genuine Windows 11 Professional Operating System, 1 TB SSD storage, keyboard & mouse and 23/27-inch LCD monitor) • Electrical controller and data acquisition system • Continuous real-time data acquisition rate up to 200kHz • Control Software and Data Analysis Software 		
7.	Integrated Inline 3D white light profilometer	<p>Fully functional Inline White Light Optical Profilometer with quad band technique, 4-colour high-brightness LED light source, white, green, red and blue. Or better</p> <ul style="list-style-type: none"> • Professional Surface 2D & 3D Mapping software for data analysis. • High speed/High resolution/Low noise camera unit, 1920 x 1200 pixels (2.3 Megapixels), Speed: 200 fps. Or better • 6 position turrets. • Autofocus and Auto-Stitching software • 10X - Objective or better • The sample should move automatically between the tribology and optical profilometer without removing the sample for inline imaging. • Comprehensive white light Optical Profilometer- Should be used as a standalone high-resolution white light optical Profilometer. • The Optical Profilometer shall be fully integrated with the existing Tribology system software. Operation, data acquisition, and analysis must be performed within the same software environment, without reliance on any 		

		third-party software.		
8.	Shall record and display	<ul style="list-style-type: none"> • Load • Frictional force • Compound wear • Wear Volume, Area and Depth, Roughness • Step height measurements • 3D profilometer images 		
9.	Versatility	<ul style="list-style-type: none"> • Tribometer must be upgraded without any hassle. High temperature and Tribo-corrosion attachments should be compatible with the present model. • Software, necessary accessories for High Temperature Tribometer and Tribo-corrosion with/without a dedicated electrochemical workstation must be suitable with current model. 		
	Vendor Qualification Criteria	<ul style="list-style-type: none"> • The vendor must have installed quoted models of Tribometer at least 2 no to Govt labs, Govt Institute, Defence labs, CISO or CSIR Labs in India within the last 3 years. Necessary installation certificates must be enclosed. • Tribometer and Optical Profilometer should be of the same make and manufacturer (proof of same needs to be submitted) and should have an option to upgrade with White light confocal microscope. • The vendor should give a demo of the quoted system at the existing customer site, online or offline, before the technical evaluation. 		
	Warranty	<ul style="list-style-type: none"> • 2 year 		

