



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

**For PR No.1000016985 (RFx No.6100000503)**

**Technical Specifications for Supply of instrument capable of software-controlled contact angle measurements, Advancing and receding contact angles, dynamic contact angle, surface free energy, Surface & Interfacial Tension by Pendent drop method and dilatational interfacial rheology or interfacial tension by pulsating drop method & should have possibility to upgrade to integrated measurement of 3D topography for roughness corrected contact angle measurement and High Pressure Chamber option with possibility to increase pressure without adding fluid to the chamber using an integrated piston inside the chamber.**

A complete Contact Angle Meter set up with software for analysis.

**Detailed Technical Specifications:**

<b>Sr. No</b>	<b>Specification</b>	<b>Details</b>
	<b>Contact Angle /Surface tension</b>	
1.	Light Source	LED-based background light with optimal contrast, size 62 mm x 62 mm
3	Measuring Range	0° to 180°
4	Measuring Resolution and accuracy	± 0.1° or better
5	Zoom Lens	zoom lens with x 6.5 magnification and a fine focus
6	Camera	<ul style="list-style-type: none"><li>• Max camera resolution 1984 x 1264</li><li>• Max camera framerate 3000 fps or better</li><li>• Camera view angle -4.5 ... 2.5 degrees</li><li>• Camera is protected from liquids spills and mechanical damage with protection by the instrument covers</li></ul>



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7	Field of view	1.44...32.3 mm diagonal
8	Image Processing System	High-performance image processing system with atleast 100 MBPS or better data transfer rate
9	Dispensing type	Automatic High Precision Single Software Controlled dispensing.
10	Sample Stage	XYZ movement. Sample stage with manual precision x (80 mm)-y (80 mm)-z (10 mm) movement and a fast-vertical adjustment. Maximum sample weight: 5 kg
11	Sample Size	60 mm x 60mm
12	Usability	Measurement indicator LED that shows automatically if system is idle or measurement is ongoing as well as if the user needs to acknowledge a message in the software
	<b>Surface Tension Measurement</b>	
1.	Surface Tension Measurement Range	0.01 to 2000 mN/m
2.	Surface Tension Measurement resolution	0.01 mN/m or better resolution
3.	Surface Tension Measurement	$\pm 0.1$ mN/m or better resolution
	<b>Image Fitting</b>	<p>1. Polynomial, Basforth-Adams, circular fit, Young-Laplace, including auto baseline algorithm</p> <p>2. Surface free energy, based on calculation equations:          Zisman, OWRK/ extended Fowkes, Wu; Acid-Base          Equation of State; Schultz 1; Schultz 2, van oss acid -base. Schultz 2</p>
13.	<b>Interfacial rheology module</b>	Software controlled drop size pulsing for interfacial rheology measurement of viscoelastic properties of interfacial layers at liquid-air or liquid-liquid interfaces. Please quote necessary cuvette & hooked needle.



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		<p>Frequency and amplitude can be easily adjusted to fit your experiment requirements. It should be Software enables automatic measurements with different frequency points.</p> <p>In addition to droplet area and surface tension, software calculates dilatational viscoelastic, elastic and viscous moduli. Should Include necessary tubing and cables.</p>
	<p><b>Software Determination</b></p>	<ol style="list-style-type: none"> <li>1. Contact angle by sessile/rising drop method with automatic base line detection</li> <li>2. Surface/ interfacial tension by pendant/ rising drop method</li> <li>3. Contact angle by liquid meniscus method</li> <li>4. System should have Software capability for interfacial rheology measurement of viscoelastic properties of interfacial layers at liquid-air or liquid-liquid interfaces</li> <li>5. Software for 3D topography</li> <li>6. Software for dynamic contact angle measurement, the advancing, receding contact angle and contact angle hysteresis are detected automatically.</li> <li>7. Volume from image functionality in the software with adjustable tolerance limits that controls the droplet volume</li> <li>8. Software for batch contact angle mode with instant result grid, including multiple samples, measurements points and time points.</li> </ol>



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	<b>Computer System</b>	The software should be compatible with Win7/8/10 and working with a 64bit system. Standard computer with i3 processor, 1TB hard drive , 22 inch monitor keyboard mouse etc.
	<b>Temperature control chamber</b>	electrically heated, ambient to 250°C
	<b>Tilting stage</b>	Tilting stage with manual tilting. Used for studying dynamic contact angles. Tilting range from 0 to 90°. Coarse and fine tilting movement.
	<b>Upgradability</b>	<p>The software should have adequate provision for incorporating additional features as and when required for getting upgraded effortlessly.</p> <p>Should have provision to upgrade with an integrated 3D Topography system for advanced adhesion and wettability studies for micro-rough surfaces that gives out roughness-corrected contact angle with one click.</p> <p>Must have provision for upgrade to external tilting cradle for accurate measurement of advancing and receding angles on hydrophobic substrates.</p> <p>Must have the option of upgrade for using High Pressure Chamber option with possibility to increase pressure without adding fluid to the chamber using an integrated piston inside the chamber.</p>
	<b>Warranty</b>	2 Years or more



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**Terms and Conditions:**

1. Technical evaluation will be done on the basis of technical specifications as per our tender notice.
2. Financial bids will be open only for those, who meet all technical specification.
3. Minimum 2 years of Warranty/Guarantee should be included and clearly mentioned. The Warranty must start from the date of installation at IITB.
4. Installation, demonstration, and training-sessions at IITB will have to be provided by the manufacturer or the vendor for the quoted system.
5. The delivery period should be specifically stated. Earlier delivery may be preferred.