

# INDIAN INSTITUTE OF TECHNOLOGY GOA

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GSTIN: 30AABAI1653D1ZF  
PAN: AABAI1653D  
TAN: BLRI08261B

Enquiry No: IITGOA/2018-19/024

Date: 22/10/2018

## **Item required at IIT Goa**

<b>Sr. no</b>	<b>Description of the item</b>	<b>Qty</b>
1	<b>Contact Angle Goniometer</b> (Detailed specifications attached)	01 No.

### **Terms and conditions:**

1. Quotation must be valid for at least 90 days.
2. The GSTIN should invariably be mentioned in your offer.
3. Delivery and installation at IIT Goa.
4. Payment: Within 30 days after the delivery and successful installation.
5. IIT Goa reserves the right to accept and/or reject any/all bids without assigning any reason.
6. Quotations shall be submitted in two parts;
  - 1) **Part – I (Technical)** should contain all the technical details and specification of the product. It should contain unpriced bid along with terms and conditions. This envelope should be marked as “Technical Bid”
  - 2) **Part -II (Financial)** The financial bid of the above item should be in a sealed envelope marked as “Financial Bid” and should contain financial terms and conditions.
- 7) All sealed quotations must reach to the Assistant Registrar (Stores & Purchase), IIT Goa, at Goa College of Engineering Campus, Farmagudi, Ponda, Goa by 17.00 Hrs on or before 02<sup>nd</sup> November, 2018”.
- 8) For any clarification, you may kindly contact Dr. Arindam Das (Contact No. 08777747613, E-mail: [arindam@iitgoa.ac.in](mailto:arindam@iitgoa.ac.in)) till 26/10/2018.

Sd/-

Asst. Registrar (S&P)

## Specifications for Contact Angle Goniometer

### Specifications:

The Instrument should be automatic and software controlled video based system to measure contact angle, surface free energy, wettability, surface tension and interfacial tension (by pendant drop or lamella counter method, or both). Also it must have surface tilting stage and provision for various measurement modules (environment chamber, temperature control, high pressure etc.) which may be added in future. **Quote different modules separately.**

### Instrument should be capable of,

1. Measuring Static, Roll-off angle, Advancing and Receding Contact angle of fluids both in air as well as in other fluid environment.
2. Dynamics studies like advancing and receding energy measurements by automatic tilting table (Tilting table must be offered as an optional item).
3. Surface energy and interfacial measurement.
4. Measuring contact angles, interfacial surface energy and surface tension based on the Inverted pendant method and captive bubble method.

### Instrument should have,

1. Manually controlled X, Y, Z positioning stage.
2. Contact angle measuring range:  $0^{\circ}$  to  $180^{\circ}$ .
3. Measuring Resolution of Contact Angle:  $0.1^{\circ}$  or better.
4. Accuracy of Contact Angle  $\pm 0.1^{\circ}$  or better.
5. Optics: high quality with integrated fine focus. High quality hysteresis less light source with adjustable intensity.
6. Backlighting: Variable intensity Fiber optic based illuminator, halogen pump.
7. Stage Size 4x4 inch or bigger.
8. Sample Size: 3 inch height or better x 6 inch or higher.
9. Digital Camera: High quality Camera with camera Speed of 200 FPS or better.
10. Maximum Camera resolution: 1024X 768 pixel or higher.
11. Image Processing System: High-performance image processing system with at least 100 MBPS or better data transfer rate.
12. Dispensing type: Automatic High Precision Single Dosing system with both manual and Software Control Dosing system should be adjustable in vertical and Horizontal position.
13. Automatic Multi Liquid Drop Dispensing System: Should be able to dispense multiple liquid of various ( $\mu$ l) drop sizes by fully software control for all dynamic studies like advancing/receding studies, adsorption etc. System with single dosing pump with multiple liquid dispensing capability is preferable.
14. The quoted model must be compatible with following special measurement modules (provided by vendor or by 3<sup>rd</sup> party recommended by the vendor) like

- i. temperature control chamber (-10 °C or less to 150 °C or more),
  - ii. high pressure chamber/module (40 bar or more)
  - iii. Temperature and Humidity control environmental chamber.
  - iv. Only humidity control chamber.
  - v. High Temperature dosing system (200 °C or more).
15. Tilting table specification (optional): Automatic software control & Manual control must be possible to measure Advancing and Receding Contact Angle as well as the roll off angle of Sessile Drops.
16. Tilting range: Option 1: 0 to +/-90 °, resolution 0.1 °
17. Surface Tension Measurement Range: 0.01 to 1000 mN/m
18. Surface Tension Measurement resolution: 0.01 mN/m or better resolution
19. Surface Tension Measurement: +/- 0.1 mN/m or better resolution
20. Most updated Desktop system with Pentium I7 core processor, speed  $\geq 3$  G Hz, HDD Memory  $\geq 1$  Tb, RAM  $\geq 8$  GB, DVD writer, sufficient USB ports and most updated windows based software, and 24 inch LED monitor.
21. Associated Software should able,
- a. To measure contact angle measurement and presentation of the static and dynamic contact angle.
  - b. To measure and analysis of surface and interfacial Tension as well as their polar and dispersive contributions.
  - c. Calculation of Surface Free Energy, analysis and presentation of the static and Dynamic contact angle with an unlimited number of liquids
  - d. Dispensing of drops to be controlled by software
  - e. To store the images of each instances in separate files.
  - f. To record video of minimum 3 minutes or better.
22. Miscellaneous:
- a. Dedicated card for the camera.
  - b. Free up-gradation of licensed software.
  - c. Calibration tools.
  - d. Power supply: 230V-50Hz.
  - e. Complete Spares/consumables for 3 years trouble free operation should be provided.
  - f. Round the clock technical support not only during the warranty period but beyond that upon the payment of annual maintenance contract.
  - g. must be compatible to with various special measurement modules like high temperature, high pressure, vacuum & humidity controlled chambers etc.
  - h. Detailed Training for 2 persons from IIT Goa in all aspects of the instrument, software application etc.
  - i. 2 years of comprehensive guarantee from the date of installation warranty for both parts and installation.
  - j. Power back up: UPS of adequate capacity should be provided for at least 1 hour of power back up.

**In addition, the instrument should be compatible with the following accessories:**

1. Accessory to measure advancing and receding contact angle of a drop by Tilting Plate Method.
2. Accessory to measure surface tension and interfacial tension by Pendant Drop Method.
3. High temperature dosing system capable of working at temperatures at least as high as 200°C.

\*\*\* The price for the above accessories **must be quoted separately.**

**Please also include the following in the quotation:**

- List of other optional accessories available for the equipment.
- Cost of other essential utilities (if any) such as compressor, filter, circulator, etc.
- Delivery and installation charges.

**In addition, please consider the following aspects while supplying the quotation**

- We are an academic institution. If you have any special discount offers for such establishments, please state them explicitly in the quotation.
- We would like to have your commitment in terms of maintenance. Please offer free annual maintenance contract (after warranty period) so that the instrument will be maintained for an additional 2 years at least.
- Please specify policy for the purchase of spares and additional attachments within 1 year of procurement
- Demonstration of having provided such satisfactory technical support to customers in India will be an added advantage.
- The vendor should supply a list of academic institutions/research laboratories wherein they have supplied similar equipment.