

INDIAN INSTITUTE OF TECHNOLOGY GOA
Goa College of Engineering Campus, Farmagudi, Ponda -403401, Goa

Enquiry No. IITGOA/2019-20/049

Date: 28/01/2020

Corrigendum to the tender for Supply of High Pressure Liquid Gas Pump & Optical Measurement Setup Compatible with Navitar Zoom Lens vide Enquiry No. IITGOA/2019-20/049 dtd. 22/01/2020.

For the tender of Supply of High Pressure Liquid Gas Pump & Optical Measurement Setup Compatible with Navitar Zoom Lens at IIT Goa, the following clauses / paragraphs have been modified:

Technical Specifications of High Pressure Liquid gas pump and Optical measurement set up

A. The Automatic High Pressure Liquid gas pump should have following technical Specifications

1. Automatic liquid and gas pump to be used with High Pressure Chamber for contact angle, interfacial tension and other droplet based interfacial measurement at 400 Bar pressure or more.
2. Pump should have capacity of 250 ml or more.
3. Pump should have automatic pressure control function to easily raise the pressure and keep it stable over time.
4. Pressure accuracy should be 0.5% of full scale or better.
5. Flow rate: 0.001 or less to - 100 ml/min or more
6. Pump should include all the required valves, connectors and tubing for connecting to a High pressure chamber working at maximum pressure of 400 bar or more.
7. Pump should be easily coupled with High Pressure chamber (400 bar or more) in future. Quote high pressure chamber separately as an optional item.

B. The Optical setup should have following technical Specifications

1. A modular visualization system for fully computer-controlled for measurement of contact angle, surface and interfacial tension.

2. Frame with back light and control electronics and an interface for extra light source and temperature control options.
3. Digital video camera with zoom
4. Camera cable coming from the camera directly. The camera with the nominal imaging speed of 130 fps or better with a 1984 x 1264 resolution, and up to 3000 fps or better with 672 x 57 or better resolutions.
5. Set up should have zoom lens and required attachments compatible with Navitar 12x F mount lens system for visualization.
6. USB3 interface to computer.
7. software for determination of contact angle by sessile/rising drop method with automatic base line detection ;surface/ interfacial tension by pendant/ rising drop method surface free energy, based on calculation equations: Zisman, OWRK/ extended Fowkes ,Wu,Acid-Base; Equation of State ; Schultz 1,Schultz 2 ;contact angle by the meniscus method” and “fully automatic dynamic contact angle with the needle method. Inbuilt liquid and solid library with predefined entries.
8. Calibration tools must be included with the set up.

Compatible computer (Laptop or PC with i7 Processor, 16GB RAM and 1 TB memory, MS office) with control software must be included in the quotation.

Both automatic HP liquid gas pump and optical setup should be compatible with each other for interfacing if required in future.

C. Compatible High pressure chamber specification

1. At least 3 viewing window, 400 bar or more maximum working pressure, 200°C or more working temperature and chamber volume of 80 ml or more. Minimum sample size of 20mm X 20 mm X 5 mm.
2. Pressure and Temperature Indicator: Pressure indicated both in a software and in a separate control panel as a part of a safety cabinet.
3. Needles with G14, G22 and G30 sizes to be supplied with high pressure connection to be used in high pressure.
4. Integrated piston design inside the measurement high pressure chamber to control pressure without adding any fluid.

5. Compatible connection or ports to handle gas/liquid from automatic High pressure liquid gas chamber,
6. Integrated sample introduction port (6-port valve).
7. Compatible with manual liquid/gas pump.
8. It must be fixable to automatic optical set up (as mentioned above) to carry out contact angle, receding contact angle , inverse contact angle and other interfacial measurements between liquid gas and liquid liquid.
9. Pump should have integrated piston/ plunger type manual piston pump to increase the inside pressure. Option to use freely any high pressure pumps, including automatic pump.
10. **Compatible high pressure chamber should be quoted separately as an optional item. .**

D. Miscellaneous:

1. Free installation including demo of handling and safety precautions.
2. Must provide a user manual.
3. Should have user-friendly menu.
4. 5 Years comprehensive warranty. In case warranty is less than 5 years, AMC must be quoted after warranty period is over.
5. Bidders must ensure supply of spare parts till minimum of 5 years after warranty period.
6. After Sale, Service should be available promptly. Round the clock technical help must be provided to the users.
7. International and domestic user list must be provided.
8. **Additional features/accessories if any that can potentially increase the productivity and safety of the instrument should be quoted separate as optional items.**

All other terms will remain same.

Sd/-
Assistant Registrar