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## SITE100

# Spinning Drop Tensiometer The KRÜSS Interface Tester



**When it comes to lowest interfacial tensions... SITE100**

- **Characterization of interfacial tensions from  $10^{-6}$  to 50 mN/m**
- **Integrated video camera**
- **Integrated temperature measurement**
- **Precise alignment stage for the camera**
- **Two low-distortion lenses integrated**
- **Ergonomic software design**
- **Up to 15000 rpm**
- **Wide range of accessories**
- **Time-proven capillary technology**

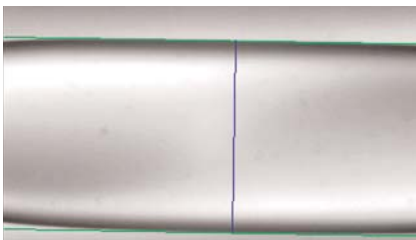


## THE INSTRUMENT FOR INTERFACIAL RESEARCH

### Interfacial Tension

When two immiscible liquids, such as oil and water, come into contact, a boundary forms between them.

Interfacial tension measures how much work is needed to increase area of this interface. Oil and water can be mixed by stabilizing droplets of oil in water by adding surfactants and co-surfactants, to avoid coalescence of oil droplets. This forms an oil in water emulsion.

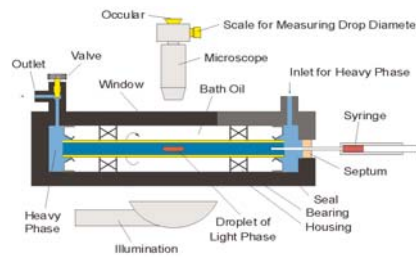


The processes of removing grease from hard surfaces using a household cleaner or petroleum from underground rock formations using tertiary oil recovery techniques also rely on lowering interfacial tension between oil and water containing surfactants. The lower the interfacial tension, the higher the efficiency of removal.

### Spinning Drop Method

The spinning drop method has been developed to measure interfacial tensions as low as 0.000001 mN/m! The measurement principle is based on the fact that the gravitational acceleration has little effect on the shape of a droplet

rotating at sufficient speed around its longitudinal axis.



A droplet located along the axis of a rotating capillary filled with denser fluid will form a cylindrical shape. With the appropriate drop volume and rotational speed, the drop diameter depends solely on the interfacial tension. The droplet stabilises in the axis of rotation, while the surrounding fluid is forced outward owing to its higher density.

### The Instrument

The instrument itself consists of two major components: The mechanical part with the capillary, the motor and the camera and the electronic module. It



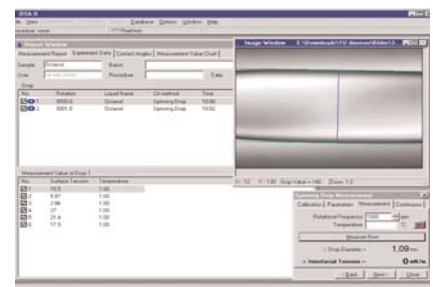
contains power supply, controlling electronics and temperature display.

It is connected via RS232 interface and video interface to a PC. The PC controls the rotational speed, performs the measurements and storing the data.

### The Software

The Software is based on the KRÜSS DSA2 image analysis software.

It controls the rotational speed of the capillary and determines the small diameter of the rotating droplet.



It allows single and automatic time dependant measurements to observe the formation of an equilibrium even for long lasting processes.

The data are displayed in numbers and in freely configurable diagrams. A report module allows the automatic creation of measurement reports.

The data are stored in a database format which can be retrieved easily by various programs.

## AVAILABLE UNITS / ACCESSORIES

- Second Microscope Stage
- Small Volume Accessory

## TECHNICAL DATA

Measuring range:  $10^{-6}$  - 50 mN/m  
Revolution speed: up to 15000 rpm  
Capillary diameter: 3.5 mm

Temperature range: 0 to 100°C  
Measuring axis: 2  
Magnifications: 2

Dimension: 30x45x30 cm  
Weight: 15 kg  
Power supply: 100 to 240 V

Technical specifications are subject to change without notice



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