

DropMaster

DMs-401



DMs-401

Compact but high performance surface measuring tool, the DMs-401 allows you to measure static and dynamic contact angles, surface free energy and surface/interfacial tension of liquids. In addition, it has sophisticated optional modular to extend functions; computer control dispenser, temperature control devices, and sliding method measurement system under tilting base.



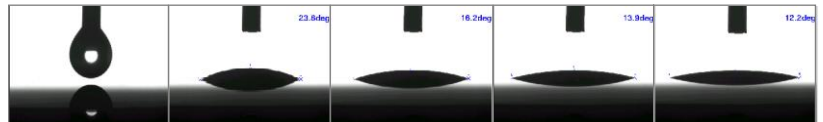
What DMs-401 enables to

Fast image capture, 60FPS

Sequential measurements fastest at 60 images per second

Application

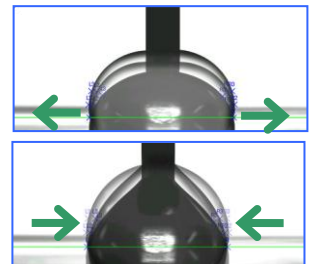
Initial spreading, absorbing property, effect of surface active agent



Extension/Contraction method

Advancing/Receding Angles are measured while increasing/decreasing the volume of captive droplet. Automatic dispenser AD-300s (option) is required for smooth dynamic motion by volume change.

Application Coating property, Repellency, Characterization of hysteresis



Sliding method

Advancing/Receding Angles are measured while tilting the stage. An angle of a droplet starting sliding is determined as Sliding Angle and Adhesive Energy between the droplet and the solid surface is analyzed at the same time. Sliding kit (option) is required.

Application

Repellency/Hydrophobicity, Characterization of droplet hysteresis



SLIDING KIT (Unit to tilt the main body)

*The photo uses the main body of DM-501.

Surface Free Energy analysis of solids

Solid surface free energies and their components are analyzed from the results of contact angle with probe liquids. Geometric mean, Harmonic mean, acid-base, Interaction analysis (Work of Adhesion, Interfacial Free Energy), Young-Dupré, Zisman are available.

Surface energy kit (option) is recommended for quick starting.

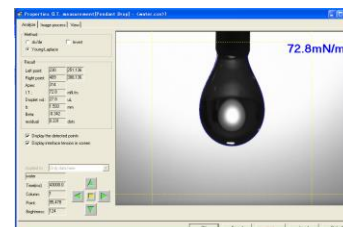
Application Adhesive property, Characterization of surface modification, Digitalization of Hydrophilicity/Hydrophobicity

Surface/Interfacial Tension of liquids

Pendant drop method enables to measure surface and interfacial tension of liquids. This method has advantages in the following points compared with conventional Wilhelmy plate and du Nouy ring methods:

- measurement with small liquid amount (less than 1mL)
- high temperature control (e.g. molten polymer applications)
- good for liquids that change surface quickly because of short time exposure in the air

Pendant drop kit (option) is required.

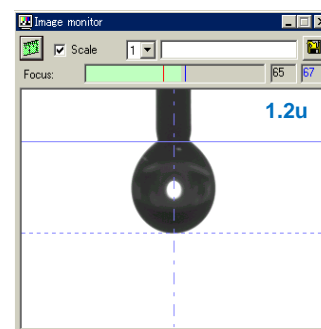


Automatic recognition of drop deposition

Transferring droplet from needle to solid surface is recognized automatically, and a certain interval of time for measurement can be managed.

Live image & Focusing aid

Live image monitor is displayed, in which the focusing aid bar graph and the reference number help your successful focusing.



Droplet volume monitoring

Actual droplet volume is displayed on the live image monitor. When using automatic dispenser AD-300s (option), the volume is controlled by computer.

Threshold level adjustment

Threshold level to determine image binary can be adjusted before and after measurement. Both relative and absolute adjustments are possible to apply the optimized image analysis.

Data chart & variable data

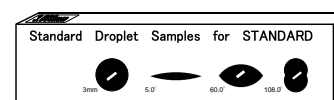
Not only contact angle/surface tension data, but also droplet volume, absorbing amount and ratio, droplet height and width are obtained at the same time, and those data versus time can be drawn on the chart.

Movie converter

The measured images of time function can be converted to MPEG/AVI movie format.

Standard droplet sample

This is a tool for periodical calibration and inspection by user. It is made of glass printed with 3 droplet images for inspection and a circle image for calibration. One suited to the standard view is included in the accessories.



STANDARD COMPONENTS

| | | | |
|---|---|--------------------------------|--------|
| DMS-401 main body* ¹ | 1 | Dispenser | 1 |
| Glass syringe set with 22G SUS needle | 5 | Teflon coated needle, 18G, 22G | 2 ea |
| Standard droplet sample (standard view) | 1 | Acrylic plate (for practice) | 1 |
| AC/DC adapter | 1 | USB cable | 1 |
| Operation manual (English) | 1 | Laptop PC (Windows in English) | Option |

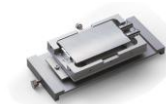
*¹ Main body equips CMOS camera, LED lamp, stage devices and dispenser holder on its chassis.

SPECIFICATION DATA

| | |
|------------------------|---|
| Measurement method | Sessile drop, Extension/contraction |
| Analysis system | θ/2 method, Tangent method, Circle fitting, Ellipse fitting |
| Measuring range | contact angle: 0 - 180° surface/interfacial tension: 0 - 80mN/m |
| Resolution | contact angle: 0.1° surface/interfacial tension: 0.1mN/m |
| Accuracy* ² | contact angle: 0.2° surface/interfacial tension: 0.2mN/m |
| Field of view | 3 step zoom: about 4.0 x 5.3mm, 7.2 x 9.6mm, 10.2 x 13.6mm |
| Sample stage size | 150 ^W x 100 ^D mm |
| Applicable sample | 150 ^W x 100 ^D x 35 ^L mm max., weight 300g max. |
| Stage movement | X-axis: 150mm by lead screw system Z-axis: 20mm by lead screw system + 20mm by positioning set screw |
| Droplet dispensing | Manual dispenser |
| Droplet deposition | By manual stage up/down motion |
| Measuring Temp. | Option: Jacket type (10 - 70°C) Heater type (ambient - 380°C) |
| Electric Power | AC100-240V~ 50/60Hz 5.5W 15VA |
| Dimensions, weight | Main body: 294 ^W x 461 ^D x 288 ^H mm, 6.1 kg (main body) |
| Environment for use | Temp.: 10 - 35°C Humidity: 30 - 80%RH (non condensing) Free from vibration and electric noise |

*² The accuracy is repeatability described in standard deviation on manufacturer's standard.

OPTIONAL ACCESSORIES



JACKET TYPE STAGE SET

for contact angle use, Temp. range: about +10 - 70°C (capable other range depended on circulator range)
A hot/cold water circulator is needed for temp. control.
A surface thermometer is needed to measure temperature of liquid surface.



HOT/COLD WATER CIRCULATOR 4VT

Water circulator bath of temperature range 0 - 80°C



JACKET TYPE CHAMBER SET

for surface/interfacial tension use
The other conditions are as same as Jacket type stage



SURFACE THERMOMETER ST-5

Handy thermometer using the platinum resistance sensor



HEATER TYPE STAGE PACKAGE

for contact angle use
Temp. range: ambient - 380°C
Temp. controller 401 (PID control system)
built in thermocouple thermometer is included in the package.



THREE-STATE MEASUREMENT KIT

parts for measuring bubble in liquid or oil in water and vice versa



PENDANT DROP KIT

special needles, cells and standard pendant samples for surface / interfacial tension measurement



HEATER TYPE CHAMBER PACKAGE

for surface/interfacial tension use
The other conditions are as same as Jacket type stage



SURFACE ENERGY KIT

extra needles and 5 probe liquids for surface free energy analysis



HYDROPHOBIC USE SYRINGE SET

with special thin 32G needle for depositing on hydrophobic surface

*The specifications and designs are subject to change without notice.

1309