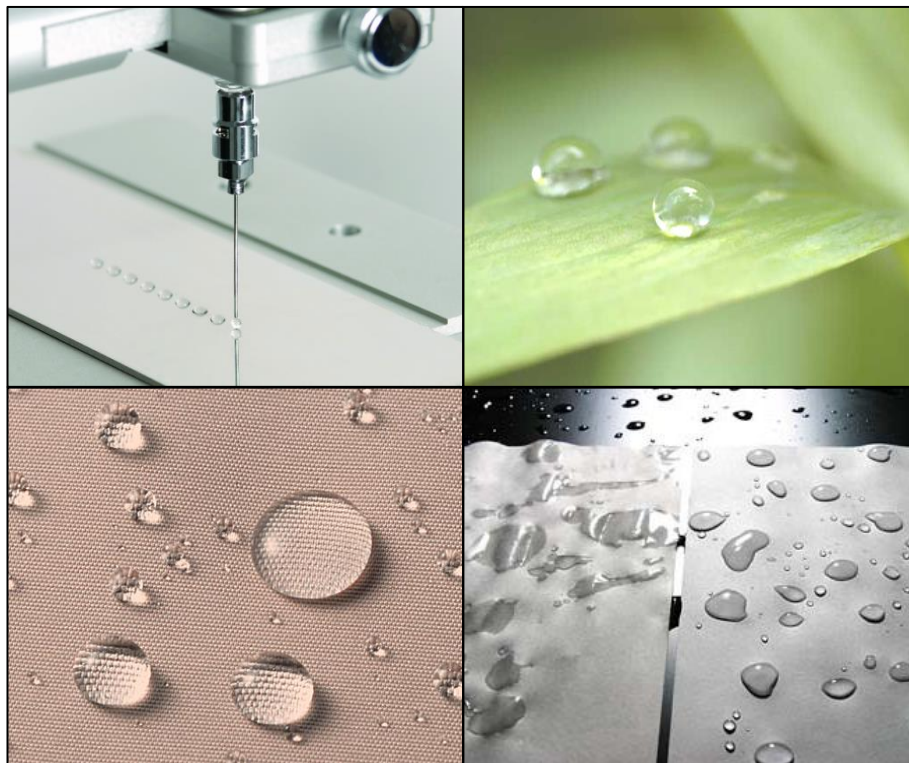


Lineup of Contact Angle Meters

Digest Information



Static / Dynamic Contact Angle

Surface / Interfacial Tension

Surface Free Energy

Adhesive Energy

The contact angle is an easy measurement method to determine the wettability of a solid substrate by a liquid. The liquid will form a drop shape when depositing a droplet onto a solid substrate. The point where the solid, liquid, and vapor meet is called the three-face point and determines the contact angle. The contact angle is also an indicator of wettability, dependent on the combination of solid substrate and liquid and the environment.

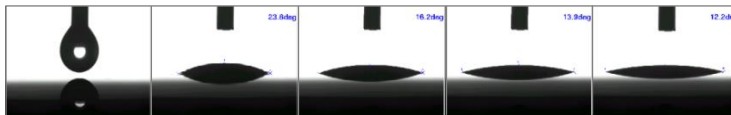
Contact angle measurements are reliable valuation techniques in various industrial fields. KYOWA is a leading manufacturer with an extensive range of contact angle meters with models from special-purpose to multi-purpose to meet multiple application demands in research & development and quality control.

Selected measurement methods of KYOWA's contact angle meters

Sessile drop method

After automatic droplet deposition recognition, automated contact angle measurements, either static or as a time function. Depending on the model, high-speed image capture with a maximum of 2700fps is possible.

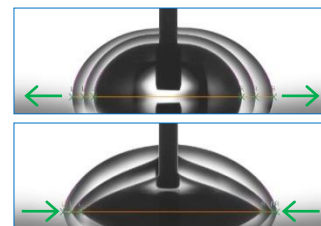
Applications: Initial spreading, absorbing property, the effect of surface-active agents



Extension/contraction method

Advancing/Receding angles are measured by increasing and decreasing the volume of a captive droplet. The optional automatic dispenser system is required to ensure reliable measurements for the volume change's smooth and precise dynamic motion.

Applications: Coating property, repellency, characterization of droplet hysteresis



Surface free energy analysis of solids

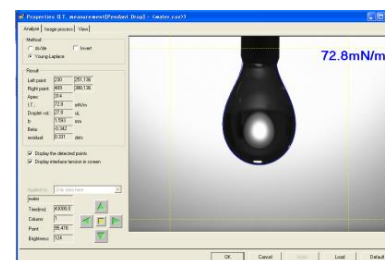
The surface free energies of solids and their polar and dispersive components are determined through contact angle measurements of at least two different liquids. Different theories according to OWRK, Owens-Wendt, Kaelble-Uy, Kitazaki-Hata, Wu, acid-base, Zisman, interaction analysis (work of adhesion, interfacial free energy), Young-Dupré, and Zisman are available. The surface free energy analysis of liquids is also possible. An optional surface free energy kit with five probe liquids and needles is available.

Applications: Adhesive properties, characterization of surface modification, evaluation of hydrophilicity/hydrophobicity

Surface/interfacial tension of liquids

The optional pendant drop kit allows for measuring liquids' surface and interfacial tension using the pendant drop method. The advantages compared to the conventional Wilhelmy plate method and du Noüy ring method are as follows:

- Measurement with a small liquid amount (less than 1mL)
- High-temperature control, such as molten polymer applications
- Suitable for liquids whose surfaces change quickly after exposure to air



Sliding method (determination of roll-off-angle and hysteresis)

Advancing/receding angles are measured using an external stage, tilting the entire measuring instrument. The angle at which a droplet starts sliding from the solid surface is determined as the sliding or roll-off angle. At the same time, the software analyzes the adhesive energy between the droplet and the solid surface. The optional sliding method kit is required.

Applications: Repellency/hydrophobicity, characterization of droplet hysteresis

Dynamic sliding method

Characterization of the speed and acceleration of droplets rolling off an inclined solid surface set at a specific angle with the help of a particular add-on module.

Applications: Repellency/hydrophobicity, characterization of droplet hysteresis


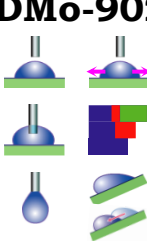

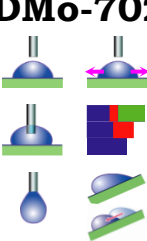

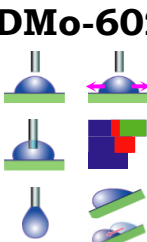

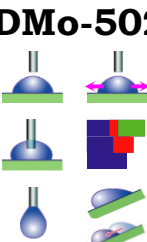

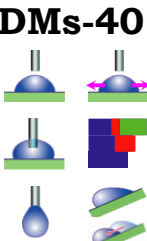

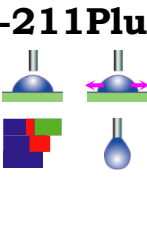


Further functions of the FAMAS analysis software








- Automatic recognition of droplet deposition
- Real-time droplet volume monitoring
- Live image & focusing aid
- Threshold level adjustment
- Data chart & variable data
- Movie converter

DropMaster series – multi-purpose models

Automatic Contact Angle Meter

	<p>DMo-902</p> 		<p>DMo-702</p> 
<p>Software-controlled stage in XY and rotation axis, software-controlled droplet deposition, and 2700fps high-speed camera</p>		<p>Software-controlled stage in X- and manual in Y-axis, software-controlled droplet deposition, and 2700fps high-speed camera</p>	
	<p>DMo-602</p> 		<p>DMo-502</p> 
<p>Manual sample stage in XY-axis, software-controlled droplet deposition, and 2700fps high-speed camera</p>		<p>Manual sample stage in XY-axis, manual droplet deposition, and 2700fps high-speed camera</p>	
	<p>DMs-401</p> 		<p>DMe-211Plus</p> 
<p>Manual sample stage in XZ-axis, manual droplet deposition, and 60fps camera</p>		<p>Manual sample stage in Z-axis, manual droplet deposition, and 30fps camera</p>	

Measurement Methods (standard or with optional accessories)

	Sessile drop method - static mode		Pendant drop method - interfacial tension measurement
	Sessile drop method - dynamic as a function of time		Sliding method - roll-off angle
	Advancing & receding angles		Dynamic sliding method - roll-off speed & acceleration
	Surface free energy analysis		


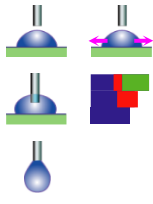

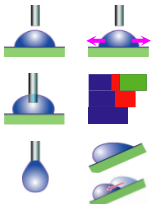
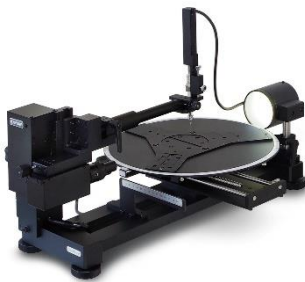
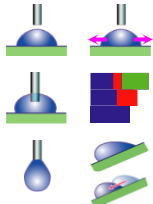
Product Comparison

ST: standard OP: option NA: not available


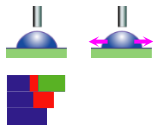

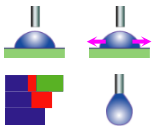

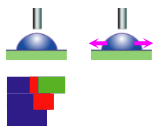


	DMo-902	DMo-702	DMo-602	DMo-502	DMs-401	DMe-211Plus
Maximum image capture rate	2700fps	2700fps	2700fps	2700fps	60fps OP (2700fps)	30fps
Optical system	manual focus with 3-step zoom	manual focus with 3-step zoom	manual focus with 3-step zoom	manual focus with 3-step zoom	manual focus with 3-step zoom	manual focus with fixed zoom
Sample stage size	150x150mm	150x150mm	150x150mm	150x150mm	150x100mm	160x100mm
Stage travel axes	motorized X, Y, and rotation	motorized X manual Y	manual X, Y	manual X, Y	manual X, Z	manual Z
Droplet deposition	motorized	motorized	motorized	manual	manual	manual
Automatic dispenser	ST	ST	ST	ST	OP	NA
Sliding method	OP	OP	OP	OP	OP	NA
Temp.-controlled stage	NA	OP	OP	OP	OP	NA
Temp.-controlled dispenser	NA	OP	OP	OP	OP	NA
Instrument dimensions (W*D*H)	297*544*249mm	297*544*249mm	297*544*249mm	297*544*249mm	294*461*288mm	170*346*283mm
Instrument weight	about 10kg	about 9kg	about 9kg	about 8kg	about 6kg	about 2 kg

DropMaster series – wafer & disk samples of diameter up to 300mm

Wafer Cleanliness and Treatment Analyzer

 <p>DMo-902WA</p>  <p>Software-controlled stage in X and rotation axis, software-controlled droplet deposition, and 2700fps high-speed camera</p>	 <p>DMo-702WA</p>  <p>Software-controlled stage in X, manual rotation axis, software-controlled droplet deposition, and 2700fps high-speed camera</p>
 <p>DMo-502WA</p>  <p>Manual sample stage in X and rotation axis, manual droplet deposition, and 2700fps high-speed camera</p>	

Contact Angle Meters – special-purpose models

<p>Microscopic Contact Angle Meter</p>  <p>MCA-4</p>  <p>The top-view camera and unique glass capillaries allow pin-point deposition of picoliter droplets on miniaturized surfaces.</p>	<p>Portable Contact Angle Meter</p>  <p>PCA-11</p>  <p>Single-click, fully automated operation, ideal for non-destructive surface evaluations and on-site quality control measurements.</p>
<p>Flat Panel Contact Angle Meter</p>  <p>FPD-CP11</p>  <p>Non-contact measurements of contact angles on flat panel displays such as LCD, LED, OLED, and silicon wafer.</p>	<p>DyneMaster Tensiometer</p>  <p>DY-500/700</p>  <p>Dynamic contact angle using the Wilhelmy plate method & powder contact angle using the Washburn method.</p>

Separate brochures for each model with more detailed information are available.

For detailed information, please get in touch with our sales partner or us directly at +81-48-483-2629 or overseas-sales@face-kyowa.co.jp.

Specifications and designs are subject to change without notice.

2309



<http://www.face-kyowa.com>

Kyowa Interface Science Co., Ltd.

5-4-41 Nobitome, Niiza-City, Saitama 352-0011, Japan

Tel.+81-48-483-2629 Fax.+81-48-483-2702