

SURFTENS automatic

Fully automatic contact angle and free surface energy measuring instrument

Features

The contact angle meter **SURFTENS^{automatic}** is designed for use in semiconductor industry and research, in particular for process control of wafer coating and in the photolithographic process.

It is characterized by the following features:

- fast and easy measurement of contact angle;
- space-saving construction
- motorized x/y stage for automatic specimen positioning
- motorized, automatic dispensation system
- software with intuitive operation
- comfortable documentation of the measuring results in protocols and in the video images;
- if required computation of free surface energy by the theory of Wu;
- automatic mappings of contact angle distribution on the wafer surface;



Fastest measuring of contact angle and homogeneity

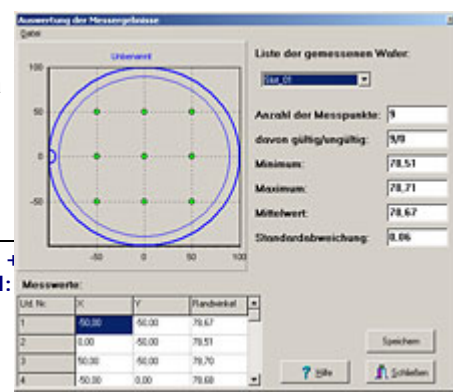
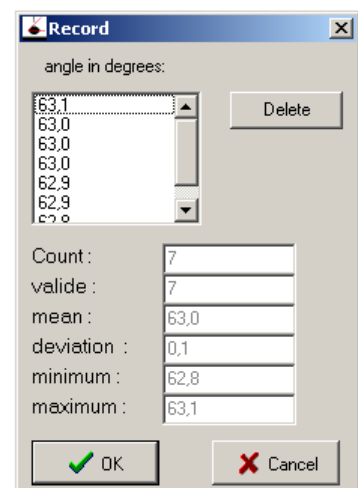
SURFTENS automatic has been specially developed for use in clean-rooms where it excels due to small size, short cycle time and simple operation.

The SURFTENS-software automatically measures contact angle with one keystroke. The stepping motor driven x/y-stage guarantees the contact angle measurement on any point on the wafer quickly.

SURFTENS measures the homogeneity of surface properties in only a few seconds. Print-out of the measuring results is just as simple and fast, and data can be transferred to QA software or configured for other formats.

Highest accuracy with automatic measuring functions

The drop of measuring liquid is produced by the built-in, automatic drop dispenser (dispense volume free definable). The image of the drop appears immediately as a high-quality, live video picture on the PC screen. Measuring is started by a single keystroke. The software determines the contact angle and immediately presents it graphically as with numerical data included. Fast measuring times of only 1 second per drop exclude errors. **SURFTENSTM** guarantees highest reproducibility and measuring accuracy combined with ease of operation. In the case of poor contrast images, a manual measuring function can be used. **SURFTENSTM** automatic is a fully automatic system with automatic drop dispensing and a stepper-motor driven table for larger surfaces such as flat-panel substrates and 8" and 12" wafers. SURFTENSTM can

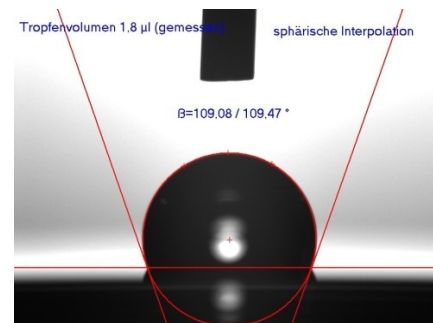
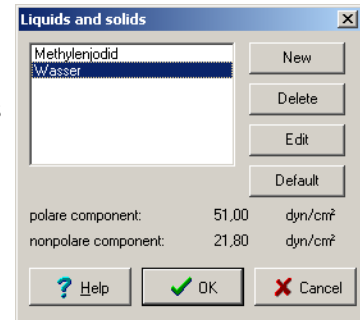


also be used to measure the surface-tension of solids and liquids.

With SURFTENS you solve your adhesion problems

Surface tension of substrates and layers used in semiconductor technology as well as surface tension of photolithography as resists and developers were determined by contact angle measurement. Measuring the contact angle allows you to quickly optimize new process steps as well as to better standardize known processes. Small changes in the surface property of wafers are seen as large, easily detected changes in the contact angle. A small investment of time used to measure the contact angle can give a

large return by avoiding later production problems (picture on the right: resist ablation due to undetected adhesion problems). To reduce defect density and feature sizes of resist structures $< 1\mu\text{m}$ a good adhesion of the resist is necessary. By help of contact angle you can control the adhesion very easily.



Technical parameters

Specimen table (standard)	SURFTENS ^{AUTOMATIC} (200 x 200) mm
Specimen thickness	max. 5 mm
Measuring range contact angle	1°....180°
Resolution / accuracy contact angle measurement	$\pm 0,05^\circ / \pm 0,5^\circ$
Optics (standard)	fixed magnification with motorized focussing
drop placement	automatic set down on the specimen surface
Camera (standard)	b/w videocamera 440.000 Pixel
Tilt of measuring optics	1°, fixed
Dispens system (standard)	Automatic, motorized, software controlled single dispensation system
Reproducibility of drop volume	0,1 μl
Software	SURFTENS for windows
Light source	light pad, adjustable brightness
Computer	Standard-PC

This features are for the standard equipment and can be adapted to other technical requirements. The technical parameters are subject to change without notice. Binding are the technical specifications as per quotation.