

# SURFTENS HL 200



## Contact Angle Meter for wafers up to 8"



Picture: SURFTENS HL 200

### Physical background

Surface tension of photolithographic materials like resist and developer has a great potential for the photolithographic process itself. For instance, homogeneity of spin coatings, planarization, and adhesion depend directly on surface tension of the materials involved. The same applies to the surface free energy (SFE) of coatings.

Surface free energy (SFE) of substrates and layers, used in semiconductor technology can be investigated 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 to measure the contact angle, can give a large return by avoiding later production problems. To reduce defect density and feature sizes of resist structures ( $<1\mu\text{m}$ ), a good adhesion of the resist is necessary. By the help of contact angle measurement, you can control the adhesion very easily.

### Features of SURFTENS HL 200

The contact angle measuring system SURFTENS HL 200 has been specially designed for use in the semiconductor industry and research, especially for process control in the surface treatment of Si wafers. It is the ideal tool, to investigate contact angle and wettability of wafers. SURFTENS HL 200 meet the needs for a fast, highly accurate and comfortable measurement of the wettability of silicon wafers.



**SURFTENS HL 200 is characterized by the following features**

- compact space-saving, closed mechanical basic setup
- high quality measuring objective, fixed focus
- USB camera
- all components are integrated in a closed housing and protected against misalignment
- homogeneous, bright LED lighting, adjustable
- wafer table, 200mm diameter, Teflon-coated
- manual positioning of wafer table in x- and phi-direction
- wafer can be placed by vacuum tweezers
- stroke of wafer table: 100mm
- rotation of wafer table: 360°

This construction allows any point on the wafer surface to be measured. The manual x and phi axes of the wafer-table are equipped with a scale so that defined positions can be approached.

Adjustments for dosing system(s):

- manual z-axis for adjustment of needle position (height)
- manual y-axis for adjustment of needle position (centring)
- manual x-axis for adjustment of needle position (focus)

Possible configuration of dosing system(s):

- one manual direct dosing system
- two manual direct dosing systems
- one automatic, software-controlled direct dosing system
- two automatic, software-controlled direct dosing systems
- combination of one manual and one automatic, software-controlled direct dosing systems

**Highest accuracy with automatic measuring functions**

The drop of test liquid (typically DI water) is produced by the manual or automatic direct dosing system. The image of the drop appears immediately as a high quality, live video picture at the PC screen. The Measurement is started by a single keystroke. The software determines the contact angle and immediately presents it graphically with numerical data included. Fast measuring times of only 1 second per drop exclude errors. **SURFTENS HL 200** guarantees highest reproducibility and measuring accuracy combined with ease of operation.

**Technical data****Dosing systems**

|                               |  |
|-------------------------------|--|
| Smallest drop volume:         | 0,2µl                                      |
| Dosing resolution / accuracy: | 0,1 µl (water)                             |
| Syringe:                      | Glass or disposable syringe with Luer-lock |

**Contact angle measurement accuracy**

|                  |                           |
|------------------|---------------------------|
| Resolution:      | 0,01°                     |
| Reproducibility: | +/-0,1° at the live video |
| Accuracy:        | 0,1°                      |

**Software**

|                   |         |
|-------------------|---------|
| Operating system: | Windows |
|-------------------|---------|

