

# OCA 20/OCAH 200 OCA 15 plus/OCAH 150 plus

Video-based optical contact angle measuring instruments

## What you can measure with the OCA 20 / OCAH 200 / OCA 15 plus / OCAH 150 plus

The contact angle video measuring systems OCA 20 and OCAH 200 are the standard systems for exacting users, whereby the OCAH 200 and OCAH 150 plus allow data transfers of up to 360 images per second. Easy to use and facilitating fast access to all control elements, the software package SCA 20 version 2 for Windows provides these instruments with the following functions:

- measurement of static and dynamic contact angles with

- max. four (max. six with the special variant E-MD/6) different liquids (optional),

- automatic needle selection and positioning,

- measurement of surface and interfacial tensions,

- determination of absorption properties on absorptive papers and non-wovens,

- calculation of surface free energies on solids and liquids as well as their contributions.

The contact angle measuring instruments OCA 20 / OCAH 200 / OCA 15 plus / OCAH 150 plus can determine the wetting properties, surface tensions, and

surface energies on the most diverse solids and liquids. Optical image processing also facilitates measurements with a high degree of reproducibility.

At the same time, the OCA 15 plus and the OCAH 150 plus are budget alternatives for users who can work with only one dosing system, e.g. to determine the surface tensions of highly viscous liquids such as printing inks and adhesives. In these cases, the OCA 15 plus and the OCAH 150 plus can be equipped with the SD-DM direct dosing system that can also easily work with disposable needles and syringes.

## Components and accessories

- high performance 6x parfocal zoom lens with an integrated continuous fine focus, and adjustable observation and camera tilt angle,

- video measuring system with high-resolution CCD camera

- and high-performance digitizing adapter (for max. 1280 x 1024 pixels), max. 50/60 images per second (OCA 20 and OCA 15 plus) and max. 360 images per second (OCAH 200 and OCAH 150 plus),

- E-MD and MD electronic and manual multiple dosing systems with max. four dosing needles (max. six with the special variant E-MD/6) and ES electronic syringe units (optional),

- SD-DE single dosing direct unit attached to the E-MD for higher-viscosity samples (optional),

- electronic tilting base units (TBA 60E and TBU 90E), wafer tables from 2" (50 mm) to 12" (300 mm) with the extended variant OCA 20L, and all temperature control systems (optional),

- refill and rinse system with



OCA 15 plus with SD-D dosing system

liquid pump cleaner RRS-LPC 3/1 (optional).

The range of control functions provided by the OCA 15 plus and OCAH 150 plus includes the following:

- SD-DM single direct dosing unit,

- HTFQ 1200 and HTFC 1500 high-temperature measuring systems and the TDU 450 temperature display unit.

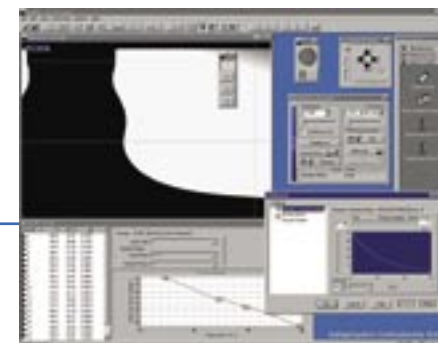
## Windows software

The 32-bit software developed for Windows NT / 2000 / XP is available in various configurations for the following functions:

- controlling of the selection and positioning of needles (with the optional E-MD), electronic syringe units, tilting and wafer table, tilting base units, and for the electric temperature control systems from -20 °C to 1700 °C,

- measurement of static and dynamic contact angles on plane, convex, and concave surfaces,

- determination of surface and interfacial tensions based on pendant and sessile drop contours and



SCA 23 software for evaluating liquid lamellae

on the interaction between liquid lamellae and test spheres or rods,

- calculation of surface free energies on solids and their contributions with specified error limits,

- generation of wetting envelope diagrams and work of adhesion / contact angle diagrams derived from surface free energies,

- calculation of dispersive and polar contributions of liquids according to various methods,

- conversion of recorded video sequences to AVI and MPEG formats,

- statistical evaluations and error analysis (SPC) with averaging, standard deviation, consistency checks within the specified limits, histograms, etc.

- access and management to a liquids and solids database with currently over 170 records for all surface energy analysis methods plus references to further reading.



OCA 20 with E-MD/4 electronic dosing system

# Technical data

	OCA 30/OCA 30L/OCAH 230/OCAH 230L	OCA 20/OCAH 200/OCA 15 plus/OCAH 150 plus and L-variants
Max. sample dimensions (L x W x H):	<ul style="list-style-type: none"> <li>• 220 x ∞ x 70 mm, max. 8" wafer on WT 200M/E with OCA 30/OCAH 230</li> <li>• 330 x ∞ x 60 mm, max. 12" wafer on WT 300M/E with OCA 30L/OCAH 230L</li> </ul>	<ul style="list-style-type: none"> <li>• 220 x ∞ x 70 mm, max. 8" wafer on WT 200M/E with OCA 20/15+/OCAH 200/150+</li> <li>• 330 x ∞ x 60 mm, max. 12" wafer on WT 300M/E with OCA 20L/OCA 15 L+/OCAH 200L</li> </ul>
Sample table dimensions:	<ul style="list-style-type: none"> <li>• 100 x 100 mm OCA 30/OCAH 230</li> <li>• 160 x 160 mm OCA 30L/OCAH 230L</li> </ul>	<ul style="list-style-type: none"> <li>• 100 x 100 mm OCA 20/15+/OCAH 200/150+</li> <li>• 160 x 160 mm OCA 20L/15L+/OCAH 200L</li> </ul>
Traversing range of x-y-z sample table:	<ul style="list-style-type: none"> <li>• 100 x 100 x 50 mm OCA 30/OCAH 230</li> <li>• 220 x 155 x 50 mm OCA 30L/OCAH 230L</li> </ul>	<ul style="list-style-type: none"> <li>• 100 x 100 x 42 mm OCA 20/15+/OCAH 200/150+</li> <li>• 220 x 155 x 42 mm OCA 20L/15L+/OCAH 200L</li> </ul>
Measuring range for contact angles:	• 0...180 °; ± 0.1 ° measuring precision of video system	
Measuring range for surface and interfacial tensions:	• 1·10 <sup>-2</sup> ... 2·10 <sup>3</sup> mN/m resolution: min. ± 0.05 mN/m	
Electronic positioning accuracy:	<ul style="list-style-type: none"> <li>• ± 0.01 mm in the sample plane</li> <li>• ± 0.005 mm perpendicular to the sample plane</li> </ul>	—
Max. sample weight:	3.0 kg	3.0 kg 15.0 kg (clamped)
Optics:	<ul style="list-style-type: none"> <li>• 6-fold zoom lens (0.7 - 4.5 magnification) with integrated continuous fine focus (± 6 mm)</li> <li>• CCD camera with a resolution of max. 1600 x 1240 pixels (768 x 576 pixels standard)</li> <li>• FOV 1.75 x 1.4–11.7 x 9 mm, image distortion &lt; 0.05%</li> </ul>	
Video system:	<ul style="list-style-type: none"> <li>• high-performance image processing system with 132 MB/s data transfer rate (compatible with Euronorm CCIR and US standard RS-170), 50 (optionally 60) images per second with OCA 20/15+</li> <li>• variable digitizing rate with max. 360 images per second for OCAH 200 / 150+ / 230 (2000/4000 images per second with OCAH 2000 / 2030 planned)</li> </ul>	
Measuring techniques:	<ul style="list-style-type: none"> <li>• Sessile and captive drop method, tilting table/base method</li> <li>• pendant and oscillating drop method, lamella method on test spheres and rods</li> </ul>	
Software:	<ul style="list-style-type: none"> <li>• <b>SCA 20:</b> video measurement of static and dynamic contact angles according to the sessile and captive drop as well as tilting table / base methods, measurement of drop and lamella contours, manipulation of max. 4 (6) ES electric dosing modules and other system components (E-MD/4(6), WT xooE/TBA 60E/TBU 90E, LDU) and of temperature control systems (TPC 150, TEC 400, NHD 400, HTFQ 1200, HTFC 1500)</li> <li>• <b>SCA 21:</b> calculation of surface free energies on solids and their contributions with error limits based on measured contact angles with any number of test liquids, evaluation according to Fowkes (geometric mean), Wu (harmonic mean), extended Fowkes (including H bonds), Zisman (critical surface tension), Owens-Wendt (dispersive and polar), van Oss and Good (acid-base theory), Schultz I + II (two-liquid method), Neumann's Equation of State (EOS), calculation of dispersive and polar contributions of liquids based on measured surface and interfacial tensions as well as contact angles with error limits, calculation of wetting envelopes and other diagrams</li> <li>• <b>SCA 22:</b> calculation of surface and interfacial tensions based on pendant drop contours and rising bubbles</li> <li>• <b>SCA 23:</b> calculation of surface tensions of liquids based on liquid lamellae on test spheres and rods</li> <li>• <b>SCA 26:</b> calculation of complex interfacial dilatational moduli based on oscillating drop contours (with OCA 30 / 230 / 20 / 200 / 2000 and oscillating drop generator ODG 20 only)</li> </ul>	
Temperature measurement and range:	<ul style="list-style-type: none"> <li>• integrated temperature measurement and digital display 2 x Pt 100 inputs for -60 – 450 °C</li> <li>For OCA 15+/150+ as option</li> </ul>	
Dimensions (L x W x H):	<ul style="list-style-type: none"> <li>• OCA 30 / OCAH 230 / OCA 10 / OCA 5</li> <li>• OCA 20 / OCA 200 / OCA 15+ / OCAH 150+</li> </ul>	590 x 220 x 550 mm
	<ul style="list-style-type: none"> <li>• OCA 30L / OCAH 230L / OCA 10L</li> <li>• OCA20L/OCAH 200L/OCA 15L+</li> </ul>	700 x 280 x 550 mm
Weight:	<ul style="list-style-type: none"> <li>• OCA 30 / OCAH 230 / OCA 20 / OCA 200L</li> <li>• OCA 30L / OCAH 230L</li> <li>• OCA 20 / OCAH 200 / OCA 15L+</li> <li>• OCA 15+ / OCAH 150+</li> </ul>	20 kg 21 kg 18 kg 16 kg
Power supply:	• 100...240Vac; 50...60Hz; 80 W	• 100...240Vac; 50...60Hz; 55 W