OCA 35

Fully automatic video-based
contact angle measuring and
contour analysis instrument

dataphysics

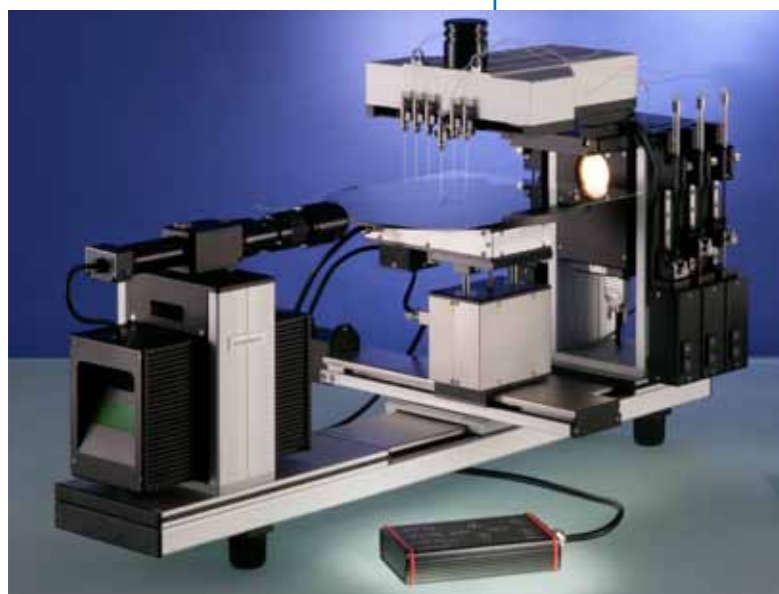**NEURTEK**
instruments

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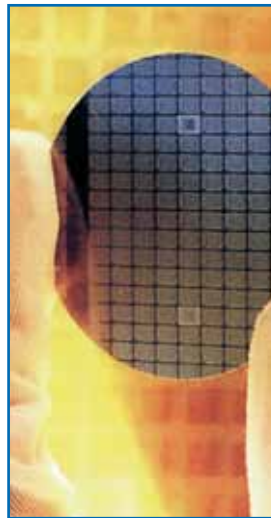
Refill and rinse system with
liquid pump cleaner RRS-LPC 3/1

Features of the OCA 35
The OCA 35 is the instrument for the fully automatic timesaving analysis of the wettability of solid surfaces, the surface free energy of solids. The automated sequence of tests and the video-based optical image processing facilitates the analysis of simple and complex sample structures at the *'push of a button'*.
For bigger samples (e.g. 12" Wafers) the OCA 35L with long X- and Y-axis is available.

Components and accessories
• sample table software controlled motorized adjustable in X-, Y- and Z-axis
• high performance 6x parfocal zoom lens with an integrated continuous fine focus, and adjustable observation angle
• video measuring system with USB cam-

era (52 images/s sample rate), easily upgradable with the high-speed option UpUSB52H (max. 146 images/s sample rate) or the high-speed video system UpOCAH (max. 1000 images/s sample rate)
• lighting with software controlled intensity without hysteresis
• high-speed video system UpHSC 2000 (max. 2200 images/s sample rate) with

high efficiency lighting with special heat eliminating appliance
• electronic multiple dosing systems E-MD for the precise automatic positioning of up to six dosing liquids
• direct dosing systems SD-DM and SD-DE
• up to six electronic syringe units ES, software controlled dosing volume (min. 50 nl) and dosing rate (0.06 µl/s...26.4 µl/s)

OCA 35/6 on tilting base unit TBU 90E 35 with electronic turn table with
vacuum fixation ETT/VAC and electronic multiple dosing system E-MD/6

OCA 35L/6 with electronic turn table with vacuum fixation
ETT/VAC and electronic multiple dosing system E-MD/6

• electronic tilting base unit TBU 90E (maximum tilt angle of 90°) and tilting base attachment TBA 60E (maximum tilt angle of 60°)
• electronic turn table with vacuum fixation ETT/VAC (top plates up to 12" diameter)
• temperature and environmental control systems (-30 ... 700 °C)
• wide range of sample holding and positioning units like holders for foils or papers FSH 30 and FSC 80/150, for single fibers FHO 40plus, or the suction plate SP 100 for holding thin flexible samples flat on the stage with an adjustable suction area
• oscillating drop generator ODG 20 and ODG 20P for the measurement of surface elasticities and for relaxational studies at phase boundaries
• electro wetting platform EWP 100 for the analysis of sessile and pendant drops

under a well definable electrical field
• top view video system TV-VS for the qualitative documentation of the drop position (USB camera with 52 images/s sample rate, 6x parfocal zoom lens and adjustable observation angle)
• refill and rinse system with liquid pump cleaner RRS-LPC 3/1
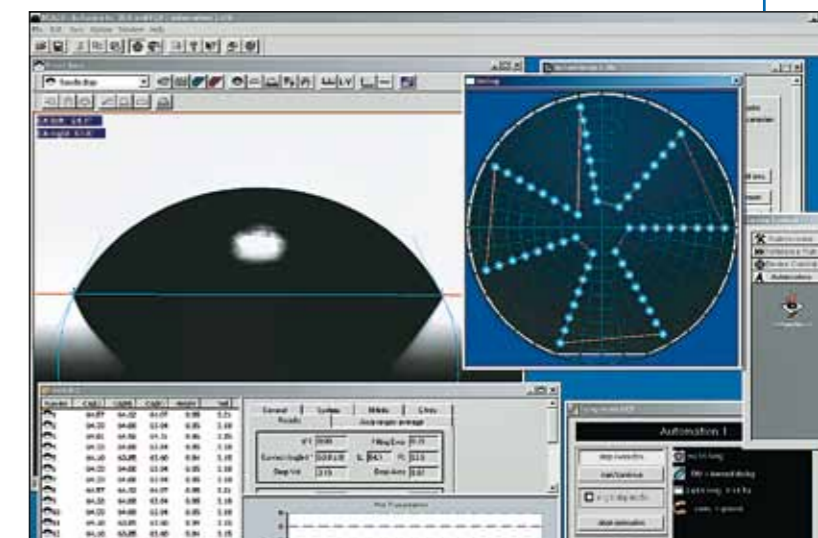
Software for efficient work
The SCA software assists you in the intuitive use of the fully automatic video-based optical contact angle measuring instrument OCA 35 by specifying measurement procedures and in collecting, assessing, and evaluating the measured data. DataPhysics is specialised in the development of high-precise and reliable methods for evaluating drop contours in combination with statistical error analysis. The SCA software is designed as a modular program for all OCA instruments. Under Windows 7® / Vista® it works in 32- and also in 64-bit mode; under Windows XP® only in 32-bit mode. The available software modules for the OCA 35 models are:

SCA 20 — contact angle
• video based measurement and presentation of the static and dynamic contact angle on plane, convex, and concave surfaces

• automatic measurement of the contact angle hysteresis
• record/store of image sequences
• statistics and measurement error analysis
• Liquids and solids database with currently more than 170 records for all surface energy analysis methods including related citations

SCA 21 — surface free energy
• analysis of the surface free energy of solids as well as their components (e.g. dispersive, polar and hydrogen bond parts, acid and base portions) according to nine different theories
• representation of wetting envelopes and work of adhesion/contact angle diagrams

SCA 22 — pendant drop
• analysis of the surface and interfacial tension, as well as their polar and dispersive contributions, based on the analysis of the drop shape of pendant drops

SCA 23 — lamella contour
• analysis of the surface and interfacial tension based on the evaluation of the lamella contour

SCA 26 — oscillation / relaxation
• analysis of the real and imaginary part of the interfacial dilatational modulus based on the oscillating or relaxing contour of pendant drops.

Suction plate SP 100

Wafer top plates WTP 6/VAC,
8/VAC, and 12/VAC

SCA 20 — fully automatic wafer mapping

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Technical data

Max. sample dimensions (L x W x H):	• 220 x ∞ x 70 mm, 8"-Wafer on WTP 8/VAC • 450 x ∞ x 70 mm, 12"-Wafer on WTP 12/VAC (OCA 35L)
Sample table dimensions:	· 100 x 100 mm
Traversing range of sample table:	• 100 x 100 x 50 mm (in X-/Y-/Z-direction) • 300 x 300 x 50 mm (in X-/Y-/Z-direction) (OCA 35L)
Max. sample weight:	• 3.0 kg
Electronic positioning accuracy:	• ± 0.01 mm in the sample plane • ± 0.005 mm perpendicular to the sample plane
Measuring range for contact angles:	• 0...180 °; ± 0.1 ° measuring precision of the video system
Measuring range for surface and interfacial tensions:	• $1 \cdot 10^{-2}$... $2 \cdot 10^{3}$ mN/m resolution: ± 0.01 mN/m
Optics:	• 6-fold zoom lens (0.7 ... 4.5-fold magnification) with integrated fine focus (± 6 mm) • Halogen lighting with software controlled adjustable intensity without hysteresis
Video system:	• USB-CCIR camera, max. pixel 768 x 576 resolution, max. sample rate 52 images/s, field of view 1,32 x 0,99...8,50 x 6,38 mm • Image distortion < 0.05 %
Software SCA 20:	• Video based 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. • Operation of up to six ES electronic syringe units and other system components (E-MD, ETT/VAC, TBA 60E, TBU 90E, RRS-LPC) and of temperature control systems (TPC 150, TEC 400/700, NHD 400/700,)), User level management system
Software SCA 21:	• Calculation of surface free energies on solids and their contributions with error limits based on measured contact angles, 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, work of adhesion, and other diagrams
Software SCA 22:	• Calculation of surface and interfacial tensions based on pendant drop contours and rising bubbles
Software SCA 23:	• Calculation of surface tensions of liquids based on liquid lamellae on test spheres and rods
Software SCA 26:	• Control of oscillating drop generator ODG 20 and ODG 20P • Calculation of complex interfacial dilatational moduli based on oscillating or relaxing drop contours
Temperature measurement:	• Integrated temperature measurement and digital display 2 x Pt 100 inputs for -60...700 °C
Dimensions (L x W x H):	• 620 x 220 x 550 mm • 880 x 470 x 550 mm (OCA 35L)
Weight:	• 20 kg • 22 kg (OCA 35L)
Power supply:	• 100...240 VAC; 50...60 Hz; 70 W (350 W with UpHSC 2000)

The contact angle measuring instruments from the OCA series share a common feature – the successful *OCA accessories construction kit*, designed to help solving your interfacial problem. This extensive range of accessories consists of various dosing systems, temperature and environment control systems, turn and tilting tables, sample positioning systems, and tilting base units.

For more information about a tailor made solution to your surface chemistry requirements, please contact us.
We will be pleased to provide a quotation, obligation free, for your instrument system.

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