

# 영 문 규 격 서

## Commodity Description

관 세 분류번호	정부물품 분류번호	품목번호	품명 및 규격서	단 위	수 량
HSK No.	GPCN No.	Item No.	Description	Unit	Q'ty
9027.80.2090		1	Contact Angle Measuring Instrument	1	Set

### A. FEATURE

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-axis and Y-axis is available. Automatic, software controlled measurement and analysis of the static and dynamic contact angle according to the "Sessile & Captive Drop-method" as well as the shape of "Pendant drops". Determination of the wettability of solid surfaces, the surface free energy of solids and other components and the calculation of the surface and interfacial tension based on the analysis of the drop shape. Upgradable to OCA 40 Micro.

### B. System Configuration

- Automated control of the sample position in x-y-z direction, the electronic dosing units, the tilting units, the electronic turn tables, and the electric temperature and environmental control systems,
- Automatic needle selection and positioning,
- Auto focus,
- Automatic measurement and analysis of static and dynamic contact angles according to the Sessile Drop-method on plane, convex, and concave surfaces,
- Automatic determination of absorption properties,
- Generation, management, and execution of automated measuring procedures (e.g. wafer and X/Y mapping),
- Easy repetition of measurements,
- Automatic calculation and presentation of surface free energies on solids and liquids as well as their contributions,
- Determination of surface and interfacial tensions based on the shape of pendant and sessile drops and on the interaction between liquid lamella and test spheres or rods,
- Generation of wetting envelope diagrams and work of adhesion / contact angle diagrams derived from surface free energies.
- The basic contact angle meter unit has to be equipped with a prism-free direct video observation facilities which enable low contact angle measurements such as 1 or 2 degree.
- Observation measuring channel of the basic unit should not have a prism in an optical light path for precise low contact angle measurement.

## C. SPECIFICATIONS

- Max. sample dimensions (L x W x H) :** • 220 x ∞ x 70 mm, 8"-Wafer on WTP 8/VAC
- Sample table dimensions :** • 100 x 100 mm
- Traversing range of sample table :** • 100 x 100 x 50 mm (in X-/Y-/Z-direction)
- 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 :** •  $1 \cdot 10^{-2} \sim 2 \cdot 10^3$  mN/m resolution: ± 0.01 mN/m
- Optics :** • High-speed contact angle measuring device for the determination of fast processes with up to 1000 images/second  
• LED lighting with software controlled adjustable intensity without hysteresis
- Video system :** • USB-Wide-VGA camera, max. resolution 752 x 480 pixel, max. sample rate 87 images/s, field of view 1.05 x 0.66...6.72 x 4.25 mm  
• Image distortion < 0.05%
- Electronic Tilting base unit :** • Tilting range: 0...90°; ±0.1°
- Temperature measurement :** • Integrated temperature measurement and digital display 2 x Pt100 inputs for -60...700 °C :
- Dimensions (L x W x H) :** • 620 x 220 x 550 mm
- Weight :** • 20kg
- Power supply :** • 100~240VAC; 50~60Hz; 70W
- Software SCA 20 :** • Video based measurement of static and dynamic contact angles according to the sessile and captive drop as well as tilting table methods, measurement of drop and lamella contours.  
• Operation of one ES electronic dosing unit
- 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' 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 lamella on test spheres and rods

## D. Accessories

Some of the most important components and accessories are listed below:

- High-speed option for USB camera (max. 146 or 311 images/s sample rate), High-speed video system UpOCAH (max. 1000 images/s sample rate), or UpHSC 2000 (sample rate 2200 images/s).
- Software controlled electronic multiple dosing systems, E-MD, for the precise automatic positioning of up to six dosing needles.
- Single direct dosing system, SD-DM or SD-DE.
- Up to six electronic syringe units, ES, with precise adjustable dosing volume (min. 50 nl) and dosing speed (0.06  $\mu\text{l/s}$ ...26.4  $\mu\text{l/s}$ ).
- Electronic tilting base unit, TBU 90E, for a maximum tilt angle of 90° and tilting base attachment, TBA 60E, for a maximum tilt angle of 60°.
- Electronic turn table with vacuum fixation, ETT/VAC, with a wide range of top plates.
- Temperature and environmental control systems (-30...700 °C).
- Wide range of sample holding and positioning units. Inc. holders for foils or papers, FSH 30 and FSC 80/150, for single fibres, FHO 40plus, or the suction plate, SP 100, for holding thin flexible samples flat on the stage, with an adjustable suction area.
- Oscillating drop generators, 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 in an electrical field.
- Top view video system, TV-VS, for the viewing and image capture of the drop position (USB camera with 52 images/s sample rate, 6x parfocal zoom lens and adjustable observation angle).
- The available software modules for the OCA 35 are:

SCA 20 — contact angle.

SCA 21 — surface free energy.

SCA 22 — pendant drop.

SCA 23 — lamella contour.

SCA 26 — oscillation / relaxation.

## E. Remark

- One-year warranty after installation.