PCA 100M Video-based portable contact angle measuring instrument

What you can measure with the PCA 100M

The video-based portable contact angle measuring instrument PCA 100M is the optical instrumentation system for measuring wetting properties on site during the production process.



Dosing and refill system for the PCA 100M/4

The controller software is designed for ease of use and fast access to all control elements and can be used on a notebook or laptop. Combined with the software SPCA 100 version 2 for Windows, the PCA 100M provides the following functions:

 measurement of static and dynamic contact angles with max. four different test liquids,

· easy repetition of measurements,

 \cdot automatic needle selection and controlled positioning,

 determination of absorption properties on absorptive products such as papers or the spreading behaviour on plastic films,

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

Whether for large or small substrate areas, the PCA 100M is the handheld instrument for controlling the qualities of coatings, examining the surface energies of corona-treated or plasma-etched polymer films in the production process, or testing the qualities of cleaned or adhesion-promoted glass surfaces prior to the next processing stage.

Components and accessories

 high-performance telecentric lens with integrated aperture and adjustable observation angle, as well as intensity control of the backlighting,

 \cdot video-based measuring system with high-resolution CCD camera

and high-performance digitizing adapter (for max. 752 x 582 pixels),

• electronic illumination with intensity controller for homogeneous backlighting,

 installed multiple dosing systems, alternatively with two or four dosing needles (PCA 100M/2 or PCA 100M/4),

• integrated automatic refill system with flushing and cleaning functions for dosing up to 5000 drops per filling, and per liquid receptacle,

• optional combination with the PCA-MS measuring stand for laboratory table top applications.

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 in horizontal and vertical direction and of the electronic syringe units with automatic refill function,

• generation, management, and execution of measuring procedures for fully automatic measuring procedures,

 measurement of static and dynamic contact angles on flat, convex, and slightly concave surfaces,

 \cdot calculation of surface free energies on solids and their contributions,

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



PCA 100M/4 with PCA-MS measuring stand

 \cdot 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.



PCA 100M/4 on a glass substrate

 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.



SPCA 100 software for measuring contact angles

Technical data

	PCA 100M	PCA 100R and RCC	
Max. sample dimensions (L x W x H):	• unrestricted, min. convex diameter of sample approx. 50 cm, min. concave diameter of sample approx. 100 cm	• 400 x 400 to 1600 x 160 sample size standardized, sample sizes on request, r convex curve diameter of sample approx. 100 cm, m concave curve diameter o sample approx. 200 cm	o mm , bigger nin. the nin. f the
Dimensions of PCA-MS sample table:	• 100 x 100 mm, special sample tables and receivers, e.g. for printing rollers, on request	_	
Measuring range for contact angles:	• 0180 °; ±0.3 ° measurin	g precision of video system	١
Max. sample weight:	• 3.0 kg on PCA-MS sample table (15.0 kg clamped)	• approx. 30 kg on sa	mple table
Optics:	 high-performance telecentric lens with observation angle, CCD camera with a FOV 6.4 x 4.8 mm, image distortion < c 	n integrated aperture and a resolution of max. 752 x 58 9.4%	adjustable 32 pixels
Video system:	 high-performance image processing system with 132 MB/s data transfer rate (compatible with Euronorm CCIR and US standard RS-170), variable digitizing rate 50 (optionally 60) images per second 		
Measuring techniques:	• sessile drop method – static and dynar	nic contact angle measure	ement
Software:	• SPCA 100: video measurement of static to the sessile drop method, manipulatic automatic refill function, definition of m • SPCA 101: calculation of surface free en with error limits based on contact angle liquids, evaluation according to Fowkes extended Fowkes (including H bonds), Z Wendt (dispersive and polar), van Oss ar (two-liquid method). Neumann's Fouati	• SRC: programmed contro components for defining semi-automatic, and dire measurement procedures visualisation of measurin colour-coded 2D presenta database of samples and results, interface to other (SECS II) and dynamic contact ang on of max. 4 electric dosing neasuring procedures ergies on solids and their smeasured with any num (geometric mean), Wu (hai isman (critical surface ten nd Good (acid-base theory) on of State (EOS) calculati	ol of all RCC fully automatic, ct command s, definition of ing sequences, g results in titons (mapping), measuring robot systems gles according g modules with contributions iber of test rmonic mean), sion), Owens-), Schultz I+II on of dispersive
	and polar contributions of liquids based ons as well as contact angles with error other diagrams	on measured surface and limits, calculation of wett	interfacial tensi- ing envelopes and
Available variants:	 PCA 100M/x: portable handheld instrument PCA 100R/x: for use with robot systems /2 with multiple dosing system for two test liquids /4 with multiple dosing system for four test liquids RCC-Z 230: z-axis robot with max. 230 mm travel RCC-XY 400, 800, 1200, 1600: X/y-axis robot with max. 1600 mm travel MT FPD 400, 600: manual x-y sample tables with max. 600 mm travel vother variants on request 		
Dimensions (L x W x H):	• 206 x 150 x 205 mm	• RCC footprint: subject	to version
Weight:	PCA 100M/2 PCA 100R /2 PCA 100R /2 PCA 100M/4 PCA 100R/4 combined PCA 100R / RCC-XY1600 / RC combined PCA 100R / FPD 800 / RCC-Z	C-Z230 230	5.2 kg 5.2 kg 5.6 kg 5.6 kg 1200 kg 800 kg
Power supply:	•100240Vac; 5060Hz; 55 W	• 100240 VAC; 5060 Hz supply from switch cabin ted PC and control systen components), RCC system 100–240 VAC approx. 800–1200 W dep equipment	; 55 W (internal et with integra- n for the RCC ;, 50–60 Hz, ending on