

**Kino**

▶ **LCD1000**

**Automatic Flat Panel Cleanness Analyzer  
/ Contact Drop Angle Meter**

*Model LCD1000A/LCD1000M*



# LCD1000

## Automatic Flat Panel Cleanness Analyzer / Contact Drop Angle Meter

Model LCD1000A/LCD1000M



LCD series—flat panel cleanness analyzers from USA KINO are interface chemical analysis based system for surface cleanness test that can be used for plasma effect evaluation based on contact angle of drop to surfaces of LCD, wafer, chip, PCB board and more.

It consists of mainframe and contact angle analytical software—CAST® 3.0. The mainframe is classified into two types—automatic model (LCD1000A) and manual model (LCD1000M) in terms of movement mode of sample stage they use. Size of sample stage and its travel range can be tailored on request. We provide clients cost—effective instruments with best performance – the most professional contact angle meter & interfacial tensiometer and technical assurance in R&D and quality control.



## Functions

### Before measurement

- Focusing via adjusting dosing system's movements of front / back / left / right / up / down, tilted angle of lens and lifting.
- Moving syringe pump back to corner via adjusting travelling mechanism movements of front / back / left / right.

### During measurement

- Measurement of contact angles at different points via adjusting travelling mechanism movements of front / back / left / right.
- Transferring droplet to LCD via lifting dosing system.
- Contact angle analysis with accuracy of up to 0.02μL.

### Measurement method

- Analyzing sensitive spots and then calculating contact angle values after drop images are captured by camera.
- Calculation methods:  $\theta/2$  method (WH) / circle fitting method
- Modification for tilted angles of lens via software enables more accurate measurement result.

## Surface cleanness analytical sample

Universal estimation method for surface cleanness analysis of inorganic solid



## Features

### Comfortable design with easy operation

–Auto syringe pump for auto dosing with accuracy of up to 0.02μL

–Auto modification for tilt angle of lens

–Just press "Measure", capture, sensitive points analysis and contact angle calculation will be done automatically without any human operation

### All points detection for panel of various specification

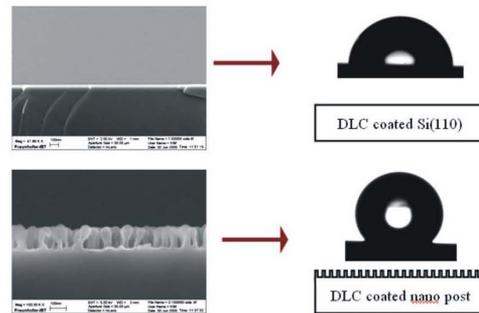
- 480x480mm(LCD-400S)
- 750x750mm(LCD-700S)
- 900x700mm(LCD-900S)
- 1400x1400mm(FPD)

## Database Management

- Historical data query
- Excel and BMP-format picture exportable
- Recording into AVI format for PPT making

## Advanced techs of CAST®3.0

- 6 kinds of methods for contact angle calculation
- 12 kinds of estimation models for surface free energy of solid
- Correction of curve base line and lens tilted angle
- Adhesive work calculation and WBA analysis



$$\sigma \cdot \left\{ \frac{1}{R_1} + \frac{1}{R_2} \right\} = \sigma \cdot \left\{ \frac{\sin \phi}{X} + \frac{1}{R_1} \right\}$$

$$\sigma_{SV} = \sigma_{SL} + \sigma_{LV} \cdot \cos \theta$$

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## Technical specifications: CAST<sup>®</sup> 3.0 analytical system

Model		LCD1000A	LCD1000M
Subject		Automatic	Manual
Mainframe	Mainframe	Description	Automatic control of sample stage
		X–Axis	Auto, travel: 600mm or larger Accuracy: 0.01mm
		Y–Axis	Auto, travel: 600mm or larger Accuracy: 0.01mm
		Z–Axis, Up/down	Auto, travel: 25mm; accuracy: 0.01mm
		Tilting of Lens	Manual
		Levelness of Sample Stage	Manual, Fine adjustment
		Control of Dosing System(XY)	Manual, travel: 12.5mm; accuracy: 0.01mm
		Control of Dosing System(Z)	Auto, travel: 25mm; accuracy: 0.01mm
		Lifting Control (Z2)	Auto, travel: 25mm; accuracy: 0.01mm
		Level Adjustment	Manual, fine adjustment to control levelness of sample stage
	Sample Stage	600*600mm or larger	
	Dosing System	Auto syringe pump	Manual syringe pump
	CCD Imaging System	Video capture device with USB & industrial B/W CCD camera Continuous zoom industrial lens with zoom of 0.7–4.5X	
	Adjustment of Optical System	Adjustment of one–dimensional tilted lens	
	Background Light System	Illumination–adjustable monochromatic LED cold light source with clearer and sharper image boundary of contact angle.	
Communication Interface	Control of mainframe & video system via USB2.0 with better compatibility and higher speed.		
Software	Calculation Process	Just left–click, our software will automatically capture image, analyze sensitive spots and then calculate contact angle.	
	Calculation Methods	Exclusive methods of $\theta/2$ , RealDrop™, circle fitting, ellipse fitting, curve ruler for analysis of dynamic / static contact angle.	
	Drop Shapes	Sessile drop (liquid/liquid, liquid/gas/liquid), pendant drop, captive drop and tilted plate method.	
	Time Dependent Contact Angle	87–340 frame/second with triggering technology	
	Dynamic Contact Angle Analysis	Advancing & receding contact angle analysis	

$$\sigma \cdot \left\{ \frac{1}{R_1} + \frac{1}{R_2} \right\} = \sigma \cdot \left\{ \frac{\sin\phi}{X} + \frac{1}{R_1} \right\}$$

Software	Estimation Models of Surface Free Energy	Exclusively providing 12 methods for estimating surface free energy, e.g. Equation of State (Neumann et al.), Good–Girifalco, Owen–Wendt–Rabel, Simple Fowkes, Extended Fowkes, WU method 1–2, Schultz method 1–2, Acid–base (Van OSS & Good), Jhu, and Zizman Plot (critical surface tension) method, can be used to measure free energy and its distribution (dispersive force, polar force and hydrogen bond value, and Lewis acid–base, etc.) of low/high energy solid surfaces.
	Adhesive work analysis	Automatically read by software
	Automatic curve base line modification: modification of upper convex surface, lower concave surface, and roughness of surface.	
	Auto / manual contact angle calculation	
	Calculation and comparison of left/right contact angles as well as their average value calculation	
	Modifications of arbitrary angle	
	Auto data graph generation	
	Powerful database for storing, compression and exporting to Excel	
	Auto estimation of drop volume	

## Special Statement from USA KINO

- The above pictures and technical specifications are subject to change without notice, and the latest confirmed product information shall prevail.
- Please contact our technical engineers for detailed data and test standard about contact angle analysis technology.
- Quotation is in terms of devices clients need.
- Customization is offered for any special request, whose prerequisite is down payment.
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**USA KINO Industry Co.,Ltd**

Strategic Investment Company: Shanghai Solon Information Technology Co.,Ltd  
E-mail: [sales@uskino.com](mailto:sales@uskino.com)  
[sales@kinochina.com](mailto:sales@kinochina.com)