Patterned Wafer Critical Dimension & Overlay Measurement System BOKI_1000

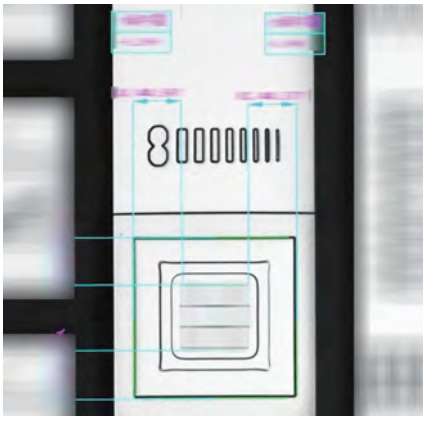
Description

Patterned Wafer Critical Dimension & Overlay Measurement System is an optical inspection instrument that can perform both high-precision XY plane dimension inspection and sub-nanometer surface 3D topography measurement. It can scan multiple regions on a large surface accurately and automatically with excellent repeatability, which significantly increases the measurement efficiency and reduces human error.

Equipping high-resolution optical lens, combining high-precision image analysis algorithm, in CNC mode the system can automatically position & recognize the measuring objects, then automatically measure and evaluate all sizes according to program. At the same time, it integrates white light interferometry measurement system, which can scan the wafer surface to create a 3D profile image of the surface, then analyze Z-direction sizes in nanometer level.

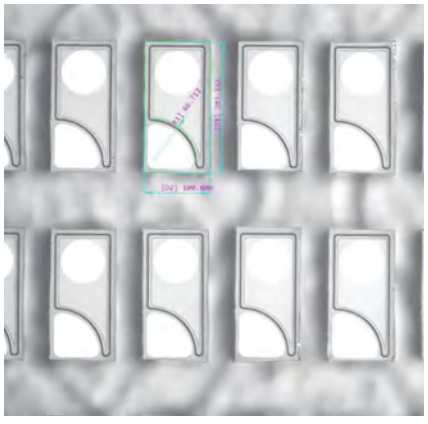
It is widely used in ultra-precision machining industries such as semiconductor manufacturing and packaging process inspection, optical processing, MEMS components, etc.

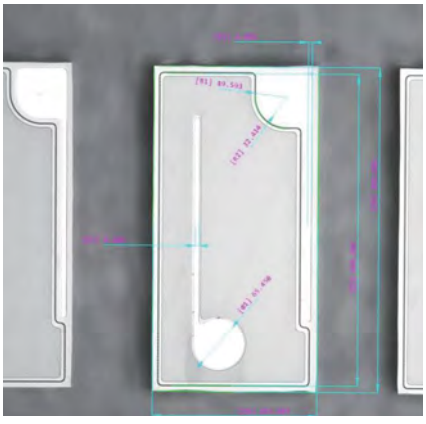
Application



Overlay Offset Measurement

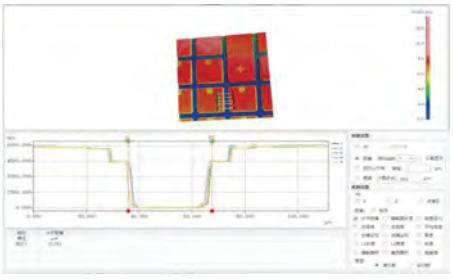
During wafer manufacturing, the offset of the overlay after photoetching process is measured in Photo area, exposure of wafer, and compensation values based on the measurement are imported into the lithography machine to optimize the stability of the wafer photoetching process.





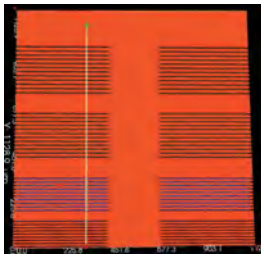
Key Dimensions Measurement

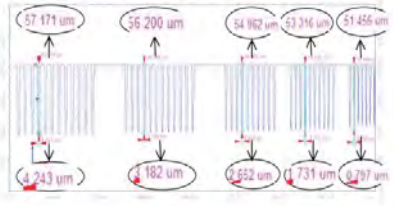
During wafer manufacturing, it requires to control critical dimensions of Die in multiple processes, and SuperView automatically extracts the feature edges of Die, and at the same time it measures all features according to program efficiently and accurately.



3D Dimensions Measurement

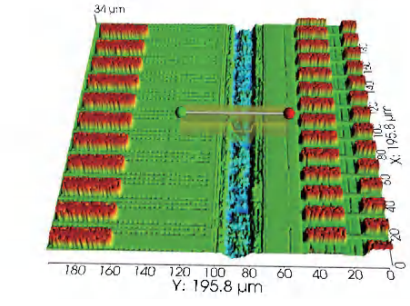
During wafer manufacturing, it is necessary to measure the bottom width of the grooves to check whether the distance between dies is qualified after the previous process in Photo area. The software automatically select multiple parabolas to obtain average value for target positions after auto scanning, then the parameters of the exposure machine is adjusted based on the measurement result in order to meet the process requirements.

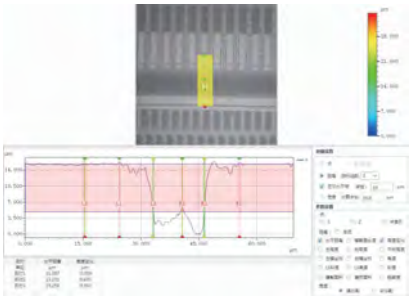




Etch Depth Measurement and Profile Analysis

Reconstruct the 3D image of the wafer, and extract the cross-sectional profile of the groove lines for analysis, then evaluate the integrity of the grooves profile and observe the defect at the bottom of grooves.





Laser Groove Depth and Width Measurement

After the laser engraving process, laser U-groove depth and width should be measured. The software can customize the width of the lasso to extract mean value profile curve of the groove, then calculate the average depth & width values of the groove. The parameters of the laser machine is adjusted to meet the process requirements based on measurement results.

Parameters

Model No.		BOKI_1000	
Loading Bin		4 pcs of Cassette, size is customizable	
Feeding Sensor		With anti-skid function	
Light Source		White/Green LED (single or double is optional)	
Barcode Scanner		Barcode recognition	
Barcode Scanner		1024X1024	
Micro Objective Lens		10×, 20×, 50×	
Measurement Accurac		10X:±0.5μm; 20X:±0.4μm; 50X:±0.3μm	
Repeatability(σ)*1		10X:±0.2μm; 20X:±0.2μm; 50X:±0.1μm	
Interferometric Objective Lens		2.5×, 5×, 10×, 20×, 50×, 100×	
Z axis Resolution		0.1nm	
Lateral Resolution (0.5λ/NA)		100X~2.5X: 0.5μm~3.7μm	
Roughness RMS Repeatability*2		0.005nm	
Surface Profile Repeatability		0.1nm	
Step Height Measurement*3		Repeatability	Accuracy
		0.1% 1σ	0.75%
Software		SuperView	
Field of View		0.49×0.49mm (@Optical Zoom 0.75×)	
Max Field of View		6×6mm	
Lens Turret		Manual 3 holes turret(Optional: Motorized 5 holes turret)	
Object Table	XY Travel Range	300×300mm	
	Load Capacity	5kg	
	Flatness	＜10μm	
	Control Mode	Motorized	
Z-Axis	Travel Range	30mm	
	Control Mode	Motorized	
Vacuum Chuck(Optional)		Negative pressure ≤-80KPa	
Overall Dimension(L×W×H)		1800×1400×1710mm	
Dustproof Device FFU		Class 1000	
Required Dust-Free Environment Level		Class 1000	
Oil-Proof Device		All guide rails must be provided with oil shields, and oil stains and other substances cannot fall out.	
Equipment Weight		800KG	
Power Supply		AC 220V,50/60HZ,13~14A,3000W	
Compressed Air		1.Air-floating anti-vibration system: Max flow 1.5LPM; Average flow 1LPM; Pressure 0.6MPa; Hose diameter 6mm; 2.Vacuum chuck: Max flow 250LPM; Average flow 180LPM; Pressure ≤ -80kpa; Hose diameter 8mm;	
Working Environment		Temp.: 15~30°C, humidity : 30~80% (no condensation)	
Safety		The equipment has door magnetic interlocking function, and the automatic door is equipped with safety grating.	

*1 Accuracy and repeatablity are obtained by measuring Standard Resolution Test Board.
*2 Roughness Performance is obtained by measuring SQ parameters of a Sa 0.2nm silicon wafer in the laboratory environment according to ISO 25178.
*3 Step height performance is obtained by measuring a standard 4.7μm stage block in the laboratory environment according to ISO 5436-1: 2000.