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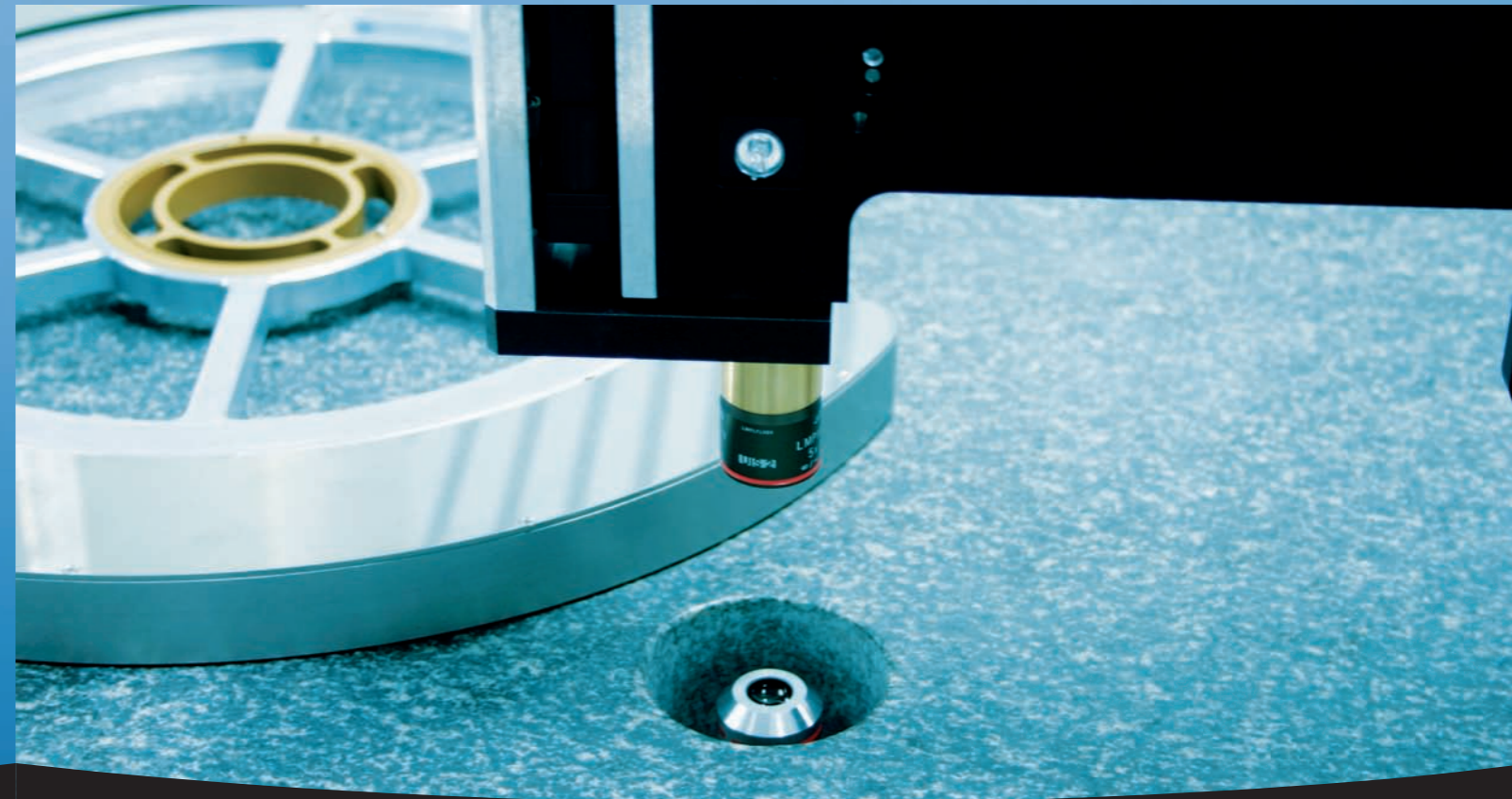
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EVG[®]40 Series

Top-to-Bottom Side Measurement Systems



www.EVGroup.com



EVG 40 Series I

Top-to-Bottom Side Measurement Systems

Introduction

EVG's measurement system EVG40NT performs highly accurate, non-destructive alignment accuracy measurements of structures on single sided wafers, double-sided wafers or of structures in the bond interface. The EVG40NT system overcomes the limitation of conventional double-view microscope and infrared systems which rely upon a complicated and time consuming procedure to calibrate the optical axes. The EVG40NT can accurately measure any type of substrates up to 300 mm in diameter. EVG's measurement system is a highly flexible tool capable of measuring across the entire wafer surface with an unlimited number of measurement points.

Unique Features / System Configuration

- Repeatable top-to-bottom side alignment accuracy (T/B) measurement
- Bond alignment accuracy verification through transmitted and/or reflective Infrared ability (IR)
- Critical dimension measurement (CD)
- Overlay / Box-in-Box measurement (BiB)
- Any wafer or substrate material up to 300 mm
- High power objectives with large depth of focus
- Absolute accuracy of +/-100 nm with a statistic probability of 99%
- High throughput due to specialized calibration routine
- PC-based measurement and pattern recognition software for highest reliability
- Versions: Semi-automated (field upgradeable to automated) and automated measurement system

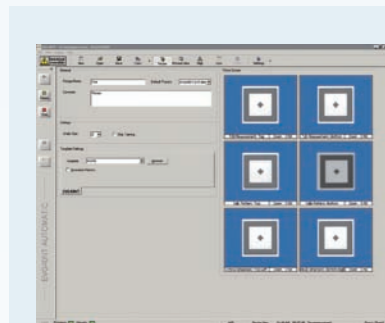
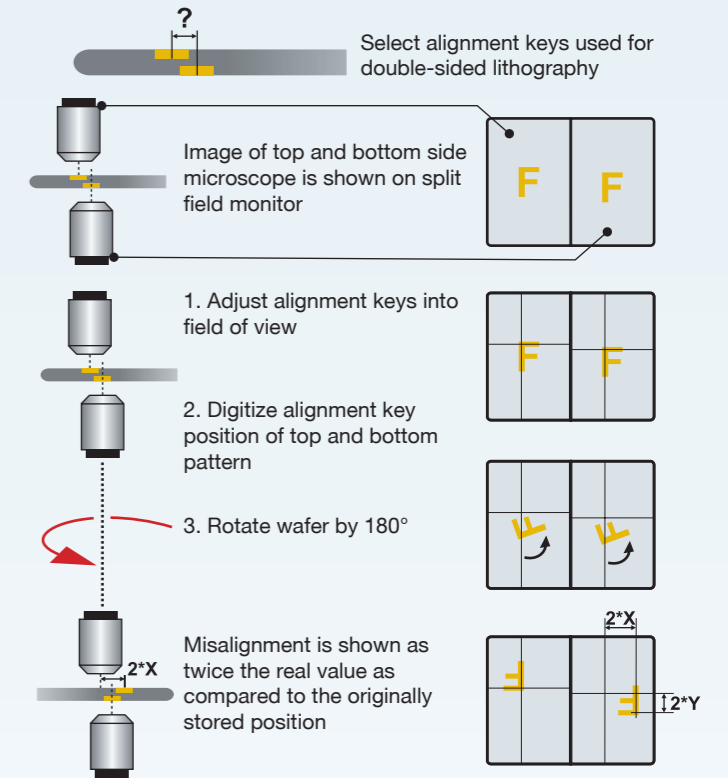
EVG's metrology system consists of top and bottom microscopes and a universal chuck. The X/Y alignment stage beneath the chuck allows for fast location of the alignment keys, eliminates extensive calibration efforts and allows processing of any substrate up to 300 mm. The entire chuck assembly is able to perform a 180° rotation which is the basis of the EVG40 series measurement principle.

Alignment targets are located and digitized prior and after rotation. Using the coordinates of these positions the overlay accuracy can be precisely calculated. System accuracy is independent from the exact location of the rotation axis. This makes the EVG40 series systems extremely robust and reliable metrology tools.



EVG®40NT Semi-automated measurement system up to 300mm

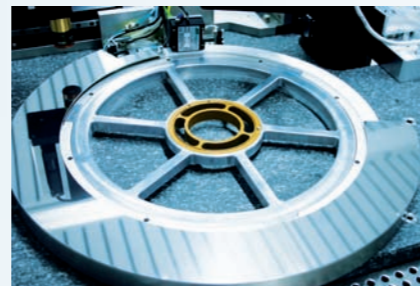
Working Principle



EVG®40NT Software and Process Control



EVG®40NT Microscope

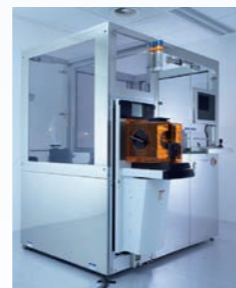


EVG®40NT Rotation chuck

Software and Process Control



Windows® based operation interface for ease of use including statistical analysis of measured values.

All measurement are logged into files accessible by any popular spreadsheet software.



EVG®40NT Fully Automated

Technical Data

		EVG®40	EVG®40NT	
				
Substrate / wafer parameters	Substrate size	up to 200 mm	up to 300 mm	
	Substrate thickness	Max. 10 mm	Max. 20 mm	
Alignment stage	Chuck alignment stage	Y: ± 5 mm X: ± 105 mm	X left = 200 mm X right = 145 mm Y back = 210 mm Y front = 150 mm	
Measurements	Accuracy	< 0.5 μm (3σ)	+/-100 nm (3σ)	
	Repeatability	0.4 μm (3σ)	+/-100 nm (3σ)	
	Reproducibility	0.4 μm (3σ)	+/-100 nm (3σ)	
	Throughput	40 – 80 measurements / hour	200 – 300 measurements / hour	
Measurement types	Top-to-Bottom (T/B)	•	•	
	Infrared	Transmitted	•	•
		Reflective	•	•
	Critical Dimension (CD)	•	•	
	Box-in-Box (BiB)	•	•	
Line width measurement	•	•		
Microscopes	Camera	Analog	Digital	
	Objectives	5x, 10x, 20x	5x, 10x, 20x	
	Depth of focus	55 μm (5x), 15 μm (10x), 6 μm (20x)	55 μm	
	Focus drive	Motorized	Motorized	
	Autofocus	N/A	Optional	