TWINSCAN NXT:1970Ci

Description

The TWINSCAN NXT:1970Ci Step-and-Scan system is a high-productivity, dual-stage immersion lithography tool designed for volume production 300-mm wafers at the sub 20-nm node.

Building on the successful in-line catadioptric lens design concept of the TWINSCAN NXT:1960Bi, the TWINSCAN NXT:1970Ci has a numerical aperture (NA) of 1.35 – the highest in the industry.

In-situ measurement and correction of optic aberrations enable maximum imaging performance for each wafer exposed when imaging at very low-k_1 .

The TWINSCAN NXT:1970Ci introduces a much improved version of the existing dual-stage concept in which stages can operate concurrently and independently. The improved stiffness and thus resulting improved dynamical performance allows significant acceleration and precision gain enabling the TWINSCAN NXT:1970Ci to achieve unprecedented focus and overlay at a significantly higher productivity level.

Advanced in-situ metrology per wafer together with a comprehensive set of options to input off-line metrology data to the scanner enable maximum overlay, focus and CDU performance on product wafers.

By combining high productivity and excellent image resolution with unprecedented overlay and focus performance, the TWINSCAN NXT:1970Ci addresses double patterning and multiple patterning requirements and thus provides a cost-effective solution for the sub 20-nm nodes.

Technical Specifications

Lens	
Wavelength:	193 nm
NA:	0.85–1.35 (variable)
Resolution:	≤ 38 nm (single exposure)
Field size, for reticle with pellicle	
• Max X:	26.0 mm
• Max Y:	33.0 mm
Overlay	
Single-machine (dedicated chuck):	≤ 2.0 nm full wafer coverage
Matched-machine (to reference wafer):	≤ 3.5 nm full wafer coverage
Production Throughput	
30 mJ/cm^2 exposure dose	
• 300-mm wafers, 96 shots:	≥ 250 wph

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Key Features and Benefits

For customers in Germany, as of March 23, 2018 this product is only available in a new and modified version, and under a different model number.

Please contact our customer support for more information.

1.35-NA 193-nm Catadioptric Projection Lens

Production resolutions down to 40 nm (C-quad) and 38 nm (dipole). In-line catadioptric lens design supporting full 26 x 33-mm field size, 4X reduction and reticle compatibility with existing designs. Lens elements are equipped with manipulators to correct for optical aberrations, thus enabling maximum productivity for low-k_1 applications.

FlexRay Prepared Illuminator for Maximum Flexibility

The next generation FlexRay Prepared illuminator extends the range of conventional and off-axis illumination to enable advanced pupil shaping for low-k_1 imaging. Since the system will be hardware prepared it can be upgraded to full FlexRay functionality, and thus support an unlimited range of freeform pupil shapes by means of a simple software upgrade.

Significant Advancement in Stage Technology

The increased stiffness of the TWINSCAN NXT:1970Ci planar Dual-Stage delivers increased speed and acceleration thus allowing a faster Step-and-Scan sequence. Together with a faster chuck swap the new design offers a major step forward in productivity. In addition, a stringent focus on serviceability has led to a design that is easily accessible in case this would ever be required.

Vastly Improved Overlay Performance

Improved stage design combined with advancements in thermal control of the wafer table ensures best possible full wafer matched overlay performance. The TWINSCAN NXT:1970Ci is capable of doing non-linear grid distortion corrections based on analyses of overlay measurements. Improved reticle alignment in combination with scanning lens elements in the projection lens allow for the next step in reticle heating correction.

Revolutionary In-situ Metrology

Innovative focus control and field-by-field leveling measurement using ultra violet light significantly reduces the system's sensitivity to process stack variations during off-line mapping of the wafer surface. Furthermore the sensor has an increased measurement density which allows for improved leveling accuracy at the edge of the wafer. A revolutionary new Parallel ILIAS (PARIS) sensor allows for a parallel measurement of optical aberrations throughout the projection slit, thus enabling a more accurate alignment, improved reticle heating correction and on the fly lens heating correction.

Increased Productivity and Reduced Defectivity

Proven 6-kHz ArF laser technology provides high power to support high throughput and is equipped with novel gas lifetime extensions to reduce downtime. Novel immersion hood design that uses CO_2 instead of air significantly reduces immersion related defects. Comprehensive service package together with TWINSCAN NXT:1970Ci maintenance scheduler which takes advantage of system idle time to perform required routine maintenance enables best optimization of system availability.

Litho-cell stability and performance control

BaseLiner is providing long-term stability for matched machine overlay, focus uniformity and mean focus of a scanner. It controls overlay and focus to a previous fingerprint. The efficiency is gained by offering high speed, off-line, YieldStar assisted metrology. As a result of this, less scanner availability investment is needed for dense overlay and focus calibrations. Also overlay WIP impact and WIP qualification time is minimized by restoring the previous (matched) overlay fingerprint after occurrence of a service action that might have changed the overlay fingerprint.

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