TWINSCAN XT:400L

365-nm Step and Scan

Description

With the TWINSCAN XT:400L ASML introduces the next generation i-line Step and Scan system. In addition to increased productivity the XT:400L introduces new options to assist advanced applications with high topography (like 3D-NAND), and small CD and CDU (like critical layers in logic / analog application). Just like previous models the XT:400L is a dual-stage lithography tool designed for volume 200-mm and 300-mm wafers production down to 220-nm resolution.

The dual wafer stage technology of the TWINSCAN platform enables the exposure of one wafer and the alignment and mapping of the next wafer to take place in parallel, thereby virtually eliminating overhead time and allowing for continuous patterning of wafers. The level sensor, in combination with the TWINSCAN leveling approach, virtually eliminates differences between inner die and edge die and ensures high yield across the entire 300-mm wafer. Furthermore, new level strategies ensure that high level topographies are handled without problems. High throughput and yield are combined with fast reticle exchange times and Lot Streaming to provide the lowest cost of operation.

Technical Specifications

Lens	
Wavelength:	365 nm
NA:	0.48-0.65
Resolution (standard):	≤ 350 nm
Resolution (annular):	≤ 280 nm
Resolution (annular + High Res.):	≤ 220 nm
Field size, for reticle with pellicle	
• Max X:	26.0 mm
• Max Y:	33.0 mm
Distortion (Dynamic)	
• Conventional:	≤ 30 nm
Overlay	
Single-machine (TOP-2):	≤ 12 nm
Matched-machine (TOP-2):	≤ 20 nm
Production Throughput	
200-mJ/cm ^{2} exposure dose, 4 mark pairs	
26 x 33-mm full field size	
• 300-mm wafers, 96 shots	≥ 230 wph
• 300-mm wafers, 96 shots	≥ 220 wph (High Resolution option)
• 200-mm wafers, 44 shots	≥ 250 wph

Key Features and Benefits

SMASH Sensor

Enables more robust mark integration when using opaque hard masks, using 2 additional alignment wavelengths (near and far infrared as well as red and green).

Variable 0.65-NA 365-nm Projection Lens With Advanced Lens Manipulator And Imaging Enhancement Options

Production resolution of 350 nm (standard), 280 nm (annular illumination), 220 nm (annular illumination + High Resolution option).

Dose Sum Check Feature

This functionality enables the possibility to do dose diagnostics during scanning exposure. It can detect dose errors of > ± 15% of the target dose.

Extended Leveling Range

Allows better on-product overlay and focus performance even for large topologies situations. Extended linear range of up to ± 3.5 µm in vertical direction.

Improved Overlay TOP-2 for XT:400

Improved overlay ≤ 20 nm for advanced applications like e.g. 3D-NAND staircase exposures.

Bridge Tool 200 mm - 300 mm

Conversion between 200 mm and 300 mm possible with less than a week downtime.