

TWINSCAN NXT:2000i

193-nm Step and Scan

Description

The TWINSCAN NXT:2000i Step-and-Scan system is a high-productivity, dual-stage immersion lithography tool designed for volume production of 300-mm wafers at the sub 7-nm node.

The TWINSCAN NXT:2000i is equipped with the successful in-line catadioptric lens design, having 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 .

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:2000i addresses multiple patterning requirements and thus provides a cost-effective solution for the sub 7-nm nodes, including cross matching with EUV based NXE scanners.

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):	≤ 1.4 nm full wafer coverage
Matched-machine (to reference wafer):	≤ 2.0 nm full wafer coverage
Production Throughput	
30 mJ/cm ² exposure dose	
• 300-mm wafers, 96 shots:	≥ 275 wph

Key Features and Benefits

For customers in Germany, 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.

Vastly Improved Overlay Performance

Multiple system innovations improving overlay in critical use cases including DUV to EUV cross matching applications. Wafer table with improved flatness & wafer load grid and with better overlay on warped product wafers. Improvements in grid setup and layout dependent grid calibration ensure best possible full wafer matched overlay performance using customer layouts.

Application dependent contributions to overlay are reduced by an improved scanner metrology system including improved capability for high order corrections. This capability also enables using in-line Wafer Heating control.

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 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.

In-Situ Metrology per Wafer Exposure with Improved Overlay and Focus Performance

A new level sensor using ultra violet light further minimizes the system's sensitivity to process stack variations during in-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. This new level sensor also improves machine to machine matching thereby enabling customers to share FEM based focus set-up among multiple scanners.

The new ORION alignment sensor brings multiple innovations including improved accuracy due to improvements in the optical architecture. To reduce dependency upon customer stack characteristics, dual polarizations for each of the alignment signals are available, avoiding having to use a weaker alignment signal. In addition the combination of using multiple alignment signals to compensate for the effect of process induced marker characteristics is supported.

The 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.

FlexWave

FlexWave is an overlay and imaging performance enhancement, using a novel lens manipulator in the pupil plane of the projection lens to control the wavefront with a high degree of freedom.

FlexWave will improve the control of lens aberration drifts in high volume manufacturing and provide the ability to adjust wavefronts for imaging and overlay enhancements means.

FlexWave supports advanced application specific wavefront shapes for enhanced imaging which can be readily designed using Tachyon SMO (Source Mask Optimization) FlexWave option. The designed wavefronts are applied to the scanner by a sub recipe.

High Productivity and Reduced Defectivity

Immersion hood design widens the window to optimize defectivity using low contact angle resists without topcoat.

Comprehensive service package together with TWINSCAN NXT:2000i maintenance scheduler which takes advantage of system idle time to perform required routine maintenance enables best optimization of system availability.

Increased Wafer per Day capability by providing optional applications with which the system will optimize scanner wafer processing time and reduces lot overhead for any specific use case.

Litho-Cell Stability and Performance Control

