TWINSCAN NXE:3400B

Description

The TWINSCAN NXE:3400B will support EUV volume production at the 7 and 5 nm nodes. Combining productivity, excellent image resolution, matched overlay to EUV NXE and ArFi NXT tools and focus performance, the TWINSCAN NXE:3400B provides lithography capability complementary to ASML's ArFi technology.

Improvements on the EUV source industrialization, overlay and focus enable a robust solution for cost effective volume production from 2018/2019 onwards.

The NXE Step-and-Scan systems use 13.5 nm EUV light, generated by a tin-based plasma source. The systems feature all-reflective 4x reduction lens assemblies from Carl Zeiss SMT with a maximum exposure field of 26 mm by 33 mm.

The NXE:3400B will be equipped with projection optics with NA 0.33 and a new illuminator with operating range sigma 0.06 - 1 to maintain high productivity while enabling low-k_1 and a resolution of 13 nm.

In-situ measurement and corrections per wafer of the optics and stages enable maximum imaging performance of overlay and CDU for each wafer exposed when imaging at low-k_1 .

Technical Specifications

NA	0.33
Resolution	13 nm
Full wafer CDU isolated lines	1.1 nm
Overlay	
• Dedicated chuck	1.4 nm
• Matched-machine	2.0 nm
Focus Control	60 nm
Productivity	≥ 125 wph

Key Features and Benefits

Projection Lens

The TWINSCAN NXE:3400B Step & Scan system includes a Zeiss 4x reduction EUV lens with the following target specifications:

- Numerical Aperture (NA) of 0.33
- A maximum scanned exposure field size of 26.0 mm by 33.0 mm

Illumination System

The NXE:3400B illumination is designed to extend the off-axis illumination imaging capabilities with advanced freeform pupil shaping for low-k_1 imaging at optimal productivity. In addition the inner/outer sigma range was increased from 0.2 – 0.9 to 0.06 – 1.0 to make optimal use of the projection lens imaging capabilities.

Overlay

Overlay accuracy is measured over the whole field and over the whole wafer.

Wafer alignment occurs at the measurement position with target detection using SMASH alignment sensors with ASML's proven phase grating alignment technique.

Focus Control and Field-by-Field Leveling

The NXE:3400B incorporates the same level sensor as the NXE:3350B, based on UV light source which reduces height process dependencies from wafer film stack variations.

Throughput

The 300-mm wafer throughput target specification for the NXE:3400B is larger than or equal to 125 wafers per hour under the following conditions: Dose: 20mJ/cm^2, die size: 26 mm x 33 mm, 96 shots.

User Interface LINUX Architecture

The system is delivered with proprietary ASML TWINSCAN software based on the Linux/Voyager operating system. Separate computing hosts are used for data access and scanner control offering the following automation interfaces: SECS, EDI, and EDA.

Plasma Source

The EUV source has the following characteristics: sufficient source power supporting 125 wph, with integrated dose control. Improvements on the EUV source industrialization in terms of power, maintenance and availability enable a robust solution for cost effective volume production from 2018/2019 onwards.

Copyright 2019 (ASML) All rights reserved