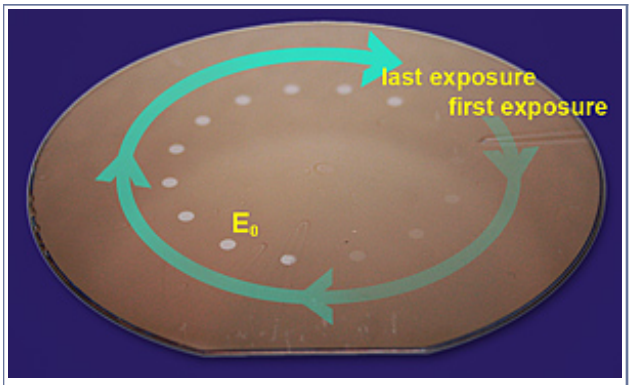
NISTTech

Apparatus & Method for X-Ray & Extreme Ultraviolet Inspection of Lithography Masks & Other Objects

Images



NIST researchers exposed a 300 mm silicon wafer with incrementally increasing doses of extreme ultraviolet light (EUV) in 15 areas. After the wafer was developed, the team determined that the seventh exposure was the minimum dose required (E0) to fully remove the resist. Credit: NIST

Abstract

Inspection of objects such as X-ray lithography masks is carried out by passing X-rays or extreme ultraviolet light through an object which absorbs in a pattern to provide a patterned X-ray or ultraviolet image which is then directed to a converter. The converter converts the image incident upon it to an image formed by electrons emitted from the converter. The emitted electrons are magnified in an electron microscope and the magnified electron image is displayed by the electron microscope. The visible image may be further digitized and processed by a computer, including long-term storage or display on a computer monitor. X-ray lithography masks may be inspected by passing X-rays through masks of the same type that will be used for lithography so that the magnified image of the X-rays passed through the masks corresponds to the pattern of X-rays that will be incident on a photoresist, allowing accurate inspection of X-ray masks before use.

Inventors

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Related Items

- Article: Exposing the Sensitivity of Extreme Ultraviolet Photoresists
- Article: Predicting the Lifetime of Extreme UV Optics

References

- U.S. Patent # 6,002,740 issued 12-14-1999 , expires 10/02/2017
- Docket: 95-036US

Status of Availability

active patent and available for licensing

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