

## **AIMS™ Mask Qualification for 32nm node**

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Moving forward to 32nm node and below optical lithography using 193nm is faced with complex requirements to be solved. Mask makers are forced to address both Double Patterning Techniques and Computational Lithography approaches such as Source Mask Optimizations and Inverse Lithography. Additionally, lithography at low k1 values increases the challenges for mask repair as well as for repair verification and review by AIMS™. Higher CD repeatability, more flexibility in the illumination patterns as well as significantly improved image performance must be added when developing the next generation mask qualification equipment. This paper reports latest measurement results verifying the appropriateness of the latest member of AIMS™ measurement tools – the AIMS™ 32-193i. We analyze CD repeatability measurements on various patterns (lines/spaces, contact holes) with and without programmed defects. The influence of the improved optical performance and newly introduced interferometer stage will be verified. This paper highlights both the new Double Patterning functionality emulating double patterning processes and the influence of its critical parameters such as overlay errors and resist impact. Beneficial advanced illumination schemes emulating scanner illumination document the AIMS™ 32-193i to meet mask maker community's requirements for the 32nm node.

**Keywords:** photomask, repair, AIMS, CD control, aerial image