EUV Lithography: From Research to Manufacturing

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We will review the current status of EUV technology and provide an outlook of the challenges that remain before EUV lithography can be used in manufacturing. It is our view that the primary challenge in implementing EUVL is not related to the imaging performance of the tools but to the development of the supporting infrastructure. Even though much progress has been achieved in recent years, several critical issues still remain unresolved. In particular, the development of EUV sources that can support high-volume manufacturing will continue to require significant investment in the next few years. Several years of intense R&D are also needed to manufacture masks with very few defects and to keep them free of any added defect during utilization. Resist materials that can support the initial introduction of EUVL have been identified recently but much remains to be done to ensure that EUV technology can be extended beyond the 32-nm half-pitch technology node. Finally, a very important step in the transition from research to manufacturing will necessitate using this technology in development fabs through a sufficient number of learning cycles. If the performance of the early EUVL exposure tools is satisfactory and high-quality EUV masks and resists are available in 2009, EUVL could be used for high volume manufacturing in 2012 or 2013.