

## Extreme UltraViolet Lithography: status and prospects

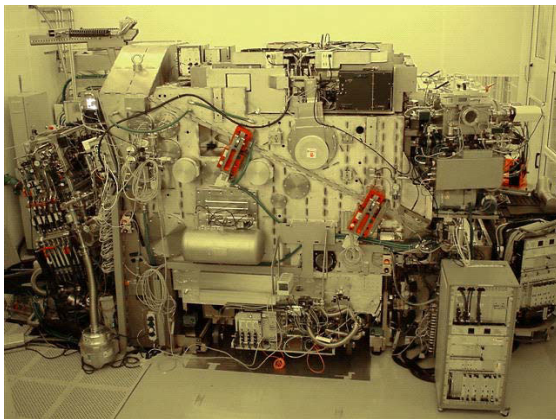
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Extreme UltraViolet Lithography (EUVL) using 13.5 nm wavelength is the leading candidate to succeed immersion 193nm lithography to print features with sizes of 32 nm and below. Several major programs worldwide have matured this technology since the late 1980's.

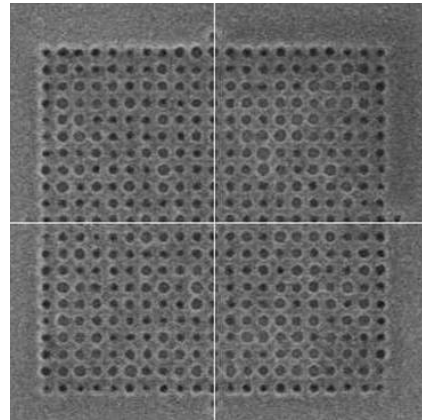
In 2006 ASML shipped the first Alpha Demo tools (NA=0.25 full field scanners) to IMEC in Belgium and CNSE in Albany, USA. Currently the development of pre-production tools with targeted shipment of 2009 is well under way.

The paper discusses most critical items for EUVL development being in our perspective: 1) EUV Imaging and 2) EUV source. Furthermore, we elaborate on the necessary developments of masks and resists. E.g. it will be quantified how resist diffusion length impacts imaging capabilities.

Results obtained with the Alpha Demo tools as well as some learning will be shared, and potential solutions to remaining challenges will be discussed. Additionally it will be explained how EUV can realize high productivity (>100 wfr/hr) and small resolutions (<22 nm) enabling an ongoing cost effective shrink of semiconductors for several generations.



EUV Alpha Demo (AD) Tool



32 nm contacts printed with AD tool