



1. Title:	EUV Resist Performance under High Stray Light Levels: an Interference Lithography Study
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3. Abstract body:

This paper will discuss the influence of flare on the performance of a range of commercially available resist materials. Flare scales with the inverse square of the imaging wavelength. This means that with the short wavelength that is used in EUV lithography, stray light will be inherently high. Pre-production full field scanners, such as ASML's Alpha Demo Tool (ADT) that now start to become available have reported flare levels above 10%. Although final productions tools will target lower values (<5%), it is unlikely that they will ever reach the levels of modern KrF or ArF scanners.

As a consequence, the high stray light levels will need to be taken into account in the mask layout. As an example, placement of dummy features has been proposed to decrease the overall reflectivity of the mask and to make the reflectivity over the entire mask area as uniform as possible. Still, EUV resists will need to cope with the high flare levels.

Preferentially they will be able to perform under a broad range of stray light levels, so that their performance is not too dependent on the mask layout.

In preparation for the installation of the ADT at IMEC, the performance of EUV resists is studied at the EUV interference lithography setup at PSI. The benefit of this systems is in its superior resolution capabilities (<20nm half pitch) and its negligible stray light level. The effect of stray light is mimicked on this tool by flood exposures over the patterned regions and can in this way be tuned over a very wide range. The performance of various resist materials in terms of LWR, resolution and exposure latitude as a function of the stray light level will be discussed.