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Lithographic metrics for the determination of intrinsic resolution limits in EUV resists

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Resist resolution remains a significant issue for EUV. Strong concerns remain with the use of chemically amplified resist owing to their diffusion characteristics. Currently EUV resist development is primarily focused on large-scale screening efforts in an attempt to identify platforms showing promise in a variety of areas with resolution arguably being the parameter of highest importance at this time. The characterization of the intrinsic resolution limit of resists, however, is not a trivial issue due to practical complications such as pattern collapse and top-loss. Note that the intrinsic resist resolution limit has been claimed to be determined by the resist diffusion length and various metrics have been proposed to characterize this diffusion length as well as resist resolution. Here we investigate a variety of resolution and diffusion length metrics and study the correlation between these metrics and observed resist performance when applied to a variety of leading EUV resists. The metrics we study include iso-focal bias, line-edge-roughness correlation length, resist modulation transfer function, corner rounding, and through-dose sub-resolution contact printing.

Keywords: extreme ultraviolet, lithography, photoresist, resolution

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