

# Development of a new underlayer to improve the adhesion of photoresist for EUV

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Metal Oxide Resist (MOR) is a promising resist candidate for Extreme ultraviolet lithography exhibiting a sufficient etch contrast with carbon-based hard masks to no longer impose a particular etch resistance to the EUV underlayer. The main objective of this study is removing spin on glass from the conventional stack to avoid using the high Global Warming Potential gases used for its patterning (Fig.1). Thus, MOR should be coated on the top of a carbon hard-mask. One of the ways to achieve this objective is by treating the surface of amorphous carbon (aC) to promote adhesion between MOR and aC.

In this work, PECVD processes have been developed and their impact on the surface energy of amorphous carbon has been investigated. The MOR spin-coated on the differently treated carbon hard-masks has then been exposed to EUV light, and developed, so that the impact of the surface treatment on pattern collapse could be studied.



Figure 1 An approach to remove the SOG from the standard flow in order to have a good adhesion between MOR and aC