



1. Title:	Quantitative Measurement of EUV Resist Outgassing
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3. Abstract body:

EUV photoresists are known to outgas during exposure to EUV radiation in the vacuum environment. This is of particular concern since some of the outgassed species may contaminate the nearby EUV optics and cause a loss of reflectivity. Due to this issue, work has been performed to measure the species and quantities outgassed from EUV resists. To date, there have been mixed results from measurements performed at various research facilities due to the challenge of accurate quantification of the outgassed species. We will show results from comprehensive EUV outgassing testing that uses multiple measurement techniques including quartz crystal microbalance tests to measure the mass loss from the resist, quadrupole mass spectrometry to measure the species and number of molecules outgassed, thermal desorption tube with external GC/MS analysis to measure the species and quantities trapped for analysis, pressure rise tests to determine the quantity of molecules outgassed, and witness plate tests with subsequent x-ray photoelectron spectroscopy analysis to determine the species that are deposited onto sample EUV "optics". All of these techniques will be combined to help understand both the effect of the outgassed species on EUV optics and to help understand which methods produce the most accurate quantitative measurement.