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Analysis of witness wafers with UNISERS wafer particle scanner

Session: AMC

Airborne molecular contamination of wafers is one of the least understood phenomenon partially due to the lack of experimental data showing correlation of specific contaminants with defects formed on wafers. Current inline metrology tools monitoring cleanroom air need to be correlated with actual defects formed on wafers. Existing analysis technologies provide an indirect assessment of the defectivity of witness wafers. A sensitive and affordable wafer particle scanner for witness wafers can be a useful tool to understand AMC and AMC related defects better.

This presentation will show the application of UNISERS surface particle scanner to scan wafers to detect the particle distribution such sub-20nm sensitivity and estimate the organic contamination. Particle detection sensitivity is preserved for high-background surfaces (e.g. copper, aluminum, etc.). Presentation will show proof of concept results on analysis of metallic wafers with pre-scan and post-scan images. The background signal (haze) of UNISERS is not very sensitive to the surface roughness but very sensitive to the organic molecular contamination of the surface. Therefore, technology can allow analysis of the organic contamination of witness wafers by contaminants. Experimental data showing the correlation of the shift of UNISERS haze with exposure time will be presented.

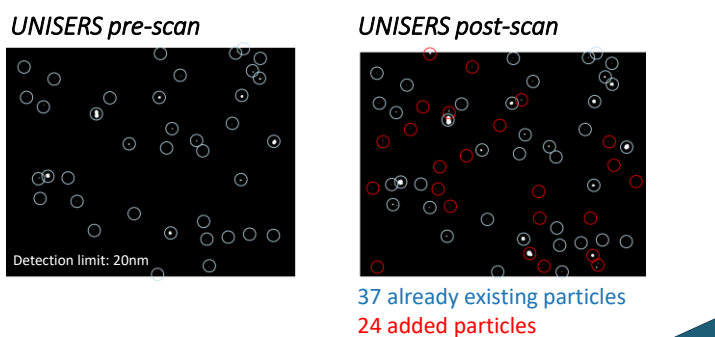


Figure 1: Application of UNISERS particle scanner to analyze witness wafers. The scan (left) shows a part of the UNISERS pre-scan image before exposure to air. Right is the post-scan image after exposure of the wafer to air for certain period of time. The added particles due to air contamination are visible.

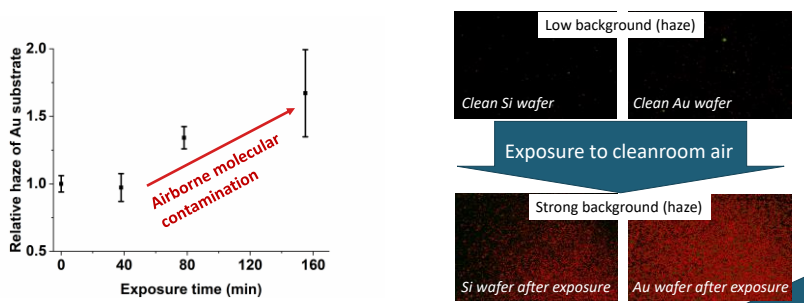


Figure 2: Background (haze) of UNISERS is very sensitive to airborne molecular contamination.