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A comprehensive evaluation of the performance and materials chemistry of a silicone-based replicating compound MICHAEL KALAN, University of Dallas, Irving, Texas, MICHAEL BRUMBACH, Sandia National Laboratories, Albuquerque, New Mexico — The objective of this project was to characterize the performance and chemistry of a silicone-based replicating compound. Some silicone replicating compounds are useful for critical inspection of surface features. Common applications are for examining micro-cracks, surface pitting, scratching, and other surface defects. Materials characterization techniques were used: FTIR, XPS, ToF-SIMS, AFM, and Confocal Microscopy to evaluate the replicating compound. These techniques allowed for the characterization and verification of the resolution capabilities and surface contamination that may be a result of using the compound. The AFM and Confocal Microscopy results showed the compound does accurately replicate the surface features to the claimed resolution. XPS and ToF-SIMS showed there is a silicone contaminant layer left behind when a cured replica is peeled off a surface. Attempts to clean off the contamination could not completely remove all silicone. The methods and results for the compounds will be presented.

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