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**Effect of Matrix-Filler Interface Adhesion on the Spall Strength of Particle-Reinforced Polymer Matrix Composites** ANTON LEBAR, ANDREW ODDY, RAFAELA AGUIAR, OREN E. PETEL, Dept of Mechanical and Aerospace Engineering, Carleton University, CARLETON UNIVERSITY IMPACT RESEARCH LAB COLLABORATION — Prior research investigating the spall strength in metal alloys has shown that the presence of secondary phase intermetallics can be a source of spall nucleation. In polymer composites with a reinforcing phase, the particle surfaces can be functionalized to improve the surface adhesion between the matrix and filler at the interface, which has been shown to improve the quasi-static strengths of the materials. In the present study, we apply silanes to modify the surface chemistry of a micron-sized alumina particles to tailor interface adhesion between the alumina filler and an elastomer matrix Sylgard 184. Two silanes were selected to both increase and decrease interface adhesion respectively to further observe the significance of interface adhesion on dynamic tensile strength. Fourier Transform Infrared Spectroscopy was used to quantify these changes in the interface adhesion between the untreated and treated particle composites. The composites were characterized through shock propagation, spall and quasi-static tensile experiments.

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