

**Investigation of the Effects of Multi-Walled Carbon Nanotubes on the
Damage Resistivity of Kevlar Reinforced Composite Plates**

by

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ABSTRACT

Multi-walled carbon nanotubes (MWNTs) were used in the fabrication of Kevlar reinforced composites to investigate the benefits that could be made to the damage resistivity of the material. Multiple samples of Kevlar composites were made with varying amounts of MWNTs mixed into the matrix.

The composite plates were all first scanned with an ultrasound machine to assess the micro structure of the matrix and fibers. The samples were then impacted with 2.5 Joules of energy on the center of each plate. This was enough to cause significant damage to the microstructure of the matrix but not enough as to display much if any visible damage at the impact location. The composite plates were then rescanned with the ultrasound machine under the same settings to see the change caused by impact.

The data from the post-impact scans was subtracted from the original scans to yield the difference over the area of the plates and show the amount of damage sustained. This difference data was analyzed to find how much of the area of the plate suffered significant damage. These results were then compared between the samples of different concentrations of MWNTs to see what effect the nanotubes had on reducing the area that sustained damage.