THE STUDY OF THE PROPERTIES OF POLYMERIC MATERIALS BOTH PRISTINE AND COATED WITH METALLIC NANO-LAYERS WITH REGARD TO IMPACT EROSION.

By

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ABSTRACT

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THE STUDY OF THE PROPERTIES OF POLYMERIC MATERIALS BOTH PRISTINE AND COATED WITH METALLIC NANO-LAYERS WITH REGARD TO IMPACT EROSION.

Under the direction of STEPHEN D. HILL, PH.D.

This project will examine the impact erosion behaviors of a variety of composites and polymer materials, as well as the effect of factors such as additives and thin film coatings on the polymers and composites. The materials to be examined will be: Polycarbonate, Polypropylene, Polyethylene, Polystyrene, PVC, and Epoxy resin. Samples of each of these six materials will be subjected to Rockwell hardness tests, three-point bending tests, and solid particle erosion tests at a normal impact angle with the goal to ascertain the behavior of these materials in regards to erosion. Additionally, samples of certain materials will be coated with a thin film layer of copper, titanium, or titanium nitride by the method of DC magnetron sputtering. The coated samples will also be subjected to erosion tests to determine the effectiveness of the coatings in improving the characteristics of erosion