

2008 Summary of Research Reports

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Project: Polymer Composites for the CUBE Magnetic Wave Sensor
Sponsor: NSA

Statement of Work:

Composite design and development Task 1: Evaluate the current design of the CUBE magnetic wave sensors and identify those elements which can possibly be improved from a materials and mechanical engineering standpoint. This could include conducting measurements on these elements to help your evaluation, and obtaining any equipment or materials necessary to facilitate this process. Task 2: To select such elements identified in Task 1 and design improvements or experimental procedures which could lead to improvements. These elements will likely include the central core, the abrasion shield, the shock isolator, and the acoustic shield. This task will also include developing improved materials. Task 3: To construct prototypes of the designs or materials which can be tested. Task 4: To develop manufacturing techniques to simplify procedures, improve properties, or lower the cost of CUBE construction. Task 5: To evaluate any new materials developed for the pursuit of further research monies, or to evaluate any new materials for use in other applications with the Department of Defense. Whitaker: Chemistry consulting Task 6: To review liquid crystal thermoset literature and technology to determine if improvements can be made in lowering the curing temperature, or in any other property of the resin. To document these findings and identify other collaborators. As time permits, to synthesize improved monomers or facilitate further development of these thermosets with other laboratories at the DoD or at University of Maryland. Task 7: As time permits, to review allylic thermoset literature and technology to determine if improvements can be made in impact or any other property of allylic resins, while maintaining its electromagnetic properties. To document these findings and identify other collaborators. As time permits, to synthesize improved monomers or facilitate further development of these thermosets.