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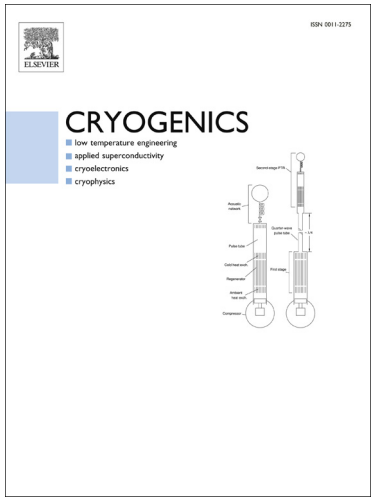

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Investigation of Woven Composites as Potential Cryogenic Tank Materials

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Abstract

In this paper, carbon fiber and Kevlar® fiber woven composites were investigated as potential cryogenic tank materials for storing liquid fuel in spacecraft or rocket. Towards that end, both carbon and Kevlar® fiber composites were manufactured and tested with and without cryogenic exposure. The focus was on the investigation of the influence of initial cryogenic exposure on the degradation of the composite. Tensile, flexural and inter laminar shear strength (ILSS) tests were conducted, which indicate that Kevlar® and carbon textile composites are potential candidates for use under cryogenic exposure.

Keywords: A: Woven Composites; B: Cryogenic Exposure; C: Polymer Matrix Composites; D: Thermosetting

1. Introduction

The field of composite materials has gained importance within the study of engineering in the recent years. Developments in material science and the study of novel materials have allowed engineers to consider the use of alternative and less traditional materials in their designs. Composite materials have been known for providing good strength to weight ratios, improved thermal and mechanical properties, and many other desirable aspects which are obtained through the combination of different constituent materials. Among myriad applications of composite materials like aircraft and naval

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