

Study of Mechanical Behavior of Unidirectional Composite Laminates According

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Abstract : Composite materials, in the most common sense of the term, are a set of synthetic materials designed and used mainly for structural applications; the mechanical function is dominant. The mechanical behaviors of the composite, as well as the degradation mechanisms leading to its rupture, depend on the nature of the constituents and on the architecture of the fiber preform. The profile is required because it guides the engineer in designing structures with precise properties in relation to the needs. This work is about studying the mechanical behavior of unidirectional composite laminates according to different failure criteria. Varying strength parameter values make it possible to compare the ultimate mechanical characteristics obtained by the criteria of Tsai-Hill, Fisher and maximum stress. The laminate is subjected to uniaxial tensile membrane forces. Estimates of their ultimate strengths and the plotting of the failure envelope constitute the principal axis of this study. Using the theory of maximum stress, we can determine the various modes of damage of the composite. The different components of the deformation are presented for different orientations of fibers.

Keywords : unidirectional kevlar/epoxy composite, failure criterion, membrane stress, deformations, failure envelope

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