STRUCTURAL CHARACTERIZATION AND MECHANICAL BEHAVIOR OF CARBON FIBER/EPOXY COMPOSITE FOR AERONAUTICAL FIELD

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Key words: carbon/epoxy composite material, mechanical properties, structural characterization, aeronautic

Summary: In the present study EP142-C510-50 woven carbon fiber fabric composite was investigated from structural/mechanical point of view, aiming manufacturing parts from the cold zone aircrafts with a service temperature of maximum 130 °C and evaluate it’s application for aeronautical industry. The composites were obtained by hand lay-up process in autoclave, proposing a cheaper technology by using an oven. EP142-C510-50 prepreg based on EP142 epoxy matrix and 3k HTA carbon fiber crowfoot 1/3were investigated. Prior to mechanical tests, a short structure network characterization, by monitoring the cure reaction of composite resins of the specimens was done by using differential scanning calorimeter (DSC). The EP142 epoxy matrix was cured at 160°C. After molding, the laminates were cut in specimens attending the SR EN ISO 14125:2000 for 3 points flexure tests, SR EN ISO527-4:2000 for tensile tests, ASTM D3479 for fatigue tests [9]. The mechanical tested samples observed by optical and scanning electron microscopy revealed their fractured and microstructure aspects. A nondestructive US method allowing elastic constant determination on a composite plate was proposed during this study and will be forewords investigate.