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A.A. Khurram, Rizwan Hussain, Hassnain Afzal, Ahsan Akram, Tayyab Subhanni



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Carbon Nanotubes for Enhanced Interface of Fiber Metal

Laminate

A. A. Khurram^{1*}, Rizwan Hussain¹, Hassnain Afzal², Ahsan Akram², Tayyab Subhanni²

¹ Laboratory for Advance Materials Processing, NCP Complex, Islamabad, Pakistan

² Department of Materials Science and Engineering, Institute of Space Technology,

Islamabad, Pakistan

*drtayyabsubhanni@gmail.com, Ph.0092-51-9075100, Fax.0092-51-9273310

Abstract

The improvement in the bonding strength of fiber metal laminate is proposed by the inclusion of multi walled carbon nanotubes (MWCNTs). The bonding strength of fiber metal laminate (FML) was studied using lap joint testing method. In the first stage the surface treatment of the aluminum sheets was carried out by varying the chromic acid bath temperature by 50, 60, 70 and 80°C. The temperature of the bath at 50°C has been resulted in superior surface texturing and higher bonding strength as verified by lap joint test of FML. The ratio of potassium dichromate in the chromic acid solution was also varied from 1.0 part to 2.5 part by 0.5. In the second stage, NH₂ functionalized MWCNTs were used in 1.0, 2.0 and 3.0 wt.% of the epoxy matrix of E-glass fiber composite to improve the bonding strength of the FML joint. The results have shown that the strength of the E-glass/epoxy and aluminum interface has been improved by the inclusion of NH₂-MWCNTs, when the samples were cured under vacuum compression as compared to the similar samples when cured under atmospheric pressure.

Key Word: Fiber Metal laminate, bonding strength, nano inclusions, lap shear test

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