

A Study on the Interlaminar Shear Strength of Carbon Fiber Reinforced Plastics Depending on the Lamination Methods

Authors : Min Sang Lee, Hee Jae Shin, In Pyo Cha, Sun Ho Ko, Hyun Kyung Yoon, Hong Gun Kim, Lee Ku Kwac

Abstract : The prepreg process among the CFRP (Carbon Fiber Reinforced Plastic) forming methods is the short term of 'Pre-impregnation', which is widely used for aerospace composites that require a high quality property such as a fiber-reinforced woven fabric, in which an epoxy hardening resin is impregnated. the reality is, however, that this process requires continuous researches and developments for its commercialization because the delamination characteristically develops between the layers when a great weight is loaded from outside. to supplement such demerit, three lamination methods among the prepreg lamination methods of CFRP were designed to minimize the delamination between the layers due to external impacts. Further, the newly designed methods and the existing lamination methods were analyzed through a mechanical characteristic test, Interlaminar Shear Strength test. The Interlaminar Shear Strength test result confirmed that the newly proposed three lamination methods, i.e. the Roll, Half and Zigzag laminations, presented more excellent strengths compared to the conventional Ply lamination. The interlaminar shear strength in the roll method with relatively dense fiber distribution was approximately 1.75% higher than that in the existing ply lamination method, and in the half method, it was approximately 0.78% higher.

Keywords : carbon fiber reinforced plastic(CFRP), pre-impregnation, laminating method, interlaminar shear strength (ILSS)

Conference Title : ICMEME 2015 : International Conference on Mechanical, Electronics and Mechatronics Engineering

Conference Location : London, United Kingdom

Conference Dates : January 19-20, 2015