World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:10, No:10, 2016

Pultrusion of Side by Side Glass/Polypropylene Fibers: Study of Flexural and Shear Properties

Authors : Behrooz Ataee, Mohammad Golzar

Abstract : The main purpose of using side by side (SBS) hybrid yarn in pultrusion thermoplastic method is reprisal the effect of high viscosity in melted thermoplastic and reduction of distance between reinforced fiber and melted thermoplastic. SBS hybrid fiber yarn composed of thermoplastic fibers and fiber reinforcement should be produced in the preparation of pultruded thermoplastic composites prepreg to reach better impregnation. An experimental set-up was designed and built to pultrude continues polypropylene and glass fiber to get obtain a suitable impregnated round prepregs. In final stage, the round prepregs come together to produce rectangular profile. Higher fiber volume fraction produces higher void volume fraction, however the second stage of the production process of rectangular profile and the cold die decrease 50% of the void volume fraction. Results show that whit increasing void volume fraction, flexural and shear strength decrease. Also, under certain conditions of parameters the pultruded profiles exhibit better flexural and shear strength. The pulling speed seems to have the greatest influence on the profile quality. In addition, adding cold die strongly increases the surface quality of rectangular profile.

Keywords : thermoplastic pultrusion, hybrid pultrusion, side-by-side fibers, impregnation
Conference Title : ICMIAE 2016 : International Conference on Mechanical, Industrial and Aerospace Engineering
Conference Location : London, United Kingdom
Conference Dates : October 17-18, 2016