

Effects of drilling parameters on delamination of kenaf-glass fibre reinforced unsaturated polyester composites

ABSTRACT

Drilling is a secondary material removal and usually carried out to facilitate fastening of parts together. Drilling of composite materials is not usually a problem-free process. Issues related to delamination composite laminates need to be addressed because it introduces the stress concentration point on the composite. This study focussed on the influence of process parameters such as spindle speed, feed rate, type of drill bits and geometry on the extend of delamination experienced by the composite during the drilling process of kenaf-glass fibre-reinforced unsaturated polyester composite, and the delamination measurements were taken under a microscope. Taguchi methods and analysis of variance were employed to find the optimal parameters. From the results, the most significant parameter was the feed rate. The minimum delamination was achieved when the feed rate was 0.05 mm/rev and spindle speed was 700r/min using both types of drill bits. The quality of the drill hole using the twist drill bit has been proven to be better than the brad drill bit.

Keyword: Delamination; Machining parameters; Hybrid; Taguchi analysis; Analysis of variance