

MODELLING AND ANALYSIS OF ABRASIVE WEAR PERFORMANCE OF GLASS EPOXY COMPOSITES USING TAGUCHI APPROACH

SUDARSHAN RAO K

Department of Mechanical Engineering, Vivekananda College of Engineering and Technology, Puttur, Karnataka, India

ABSTRACT

An experimental investigation was carried out to study the effect of the filler weight fraction, normal load, and sliding distance on the abrasive wear behavior of glass epoxy composite. In this study, comparative abrasive wear performance of glass fiber reinforced epoxy composite system filled with varying weight fraction of alumina fillers has been reported. Wear studies were carried out using rubber wheel abrasion test rig. Findings of the experiments indicate that abrasive wear of the composites depend on the applied load, sliding distance, as well as on the weight fraction of fillers. A plan of experiments, based on Taguchi technique is performed to acquire data in controlled way. An orthogonal array and the analysis of variance were employed to investigate the influence of process parameters on the wear of these composites. Results showed that, weight loss of the composites increases with increase in applied load and sliding distance and decreases with the increase in weight fraction of alumina filler. Among the control parameters, sliding distance has the highest statistical influence on the abrasive wear of the composites, followed by normal load and filler content. Finally, confirmation tests were conducted to verify the experimental results foreseen from the mentioned correlations, it is found that there is a good agreement between the estimated and the experimental value of S/N ratio with an error of 1.48%.

KEYWORDS: Composite, Filler, Abrasive Wear, Taguchi, Alumina