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Abstract

This study investigated the effects of cutting parameters on the quality characteristics of thrust force (Ft), surface roughness (Ra), dimensional accuracy (Da) and burr height (Bh) during the drilling of Al/10B_4C and Al/10B_4C/5Gr composites. Machinability experiments were carried out with uncoated carbide twist drills at three different cutting speeds (18, 25 and 35 m/min) and three different feed rates (0.08, 0.112 and 0.16 mm/rev) under dry cutting conditions. The percent contribution of the cutting/drilling parameters/variables to the quality characteristics was determined using analysis of variance (ANOVA), and predictive linear equations were developed for the estimation of all the quality characteristics. As a result of the experimental study, it was determined that during the drilling of the composites, the 5% graphite reinforcement of Al/10B_4C/5Gr decreased the thrust force and the burr height, improved the surface quality and brought the composite closer to its ideal diameter value.

Keywords: MMCs, Drilling, Thrust force, Surface roughness, Dimensional accuracy, Burr height

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