EFFECT OF WIRE FEED RATE AND WIRE TENSION DURING MACHINING OF PR-AL-SiC-MMC,s BY WEDM

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ABSTRACT

The widespread adoption of particulate metal matrix composites for engineering applications has been hindered by the high cost of producing components. Although several technical challenges exist with casting technology yet it can be used to overcome this problem. Achieving a uniform distribution of reinforcement within the matrix is one such challenge, which affects directly on the properties and quality of composite material. In this study aluminium (Al-6063)/ Silicon carbide (SiC) reinforced particles metal-matrix composites (MMCs) are fabricated by melt-stirring technique. The MMCs bars and circular plates are prepared with the reinforced particles of SiC by weight fraction 15% and average reinforced particles sizes of SiC are 300 mesh. The stirring process is carried out at 200 rev/min rotating speed by graphite impeller for 15 min. The series of machining tests are performed on CNC Wire cut EDM. Prepared specimens of Al/SiC MMCs are used as work piece (anode), brass wire of diameter 0.25 mm is used as wire electrode and water is used as the dielectric fluid. The parameters are investigated Cutting Speed Vc mm/min, Width of cut b mm, Spark Gap Wg mm, Metal Removal Rate MMR mm^3 /min, Surface roughness Ra (µm), Peak Roughness Rz(µm) for each experiment by varying Wire Feed Rate W_F (4 m/mim, 5 m/mim,6 m/mim,7 m/mim,) and Wire Tension W_T (780 gms, 900 gms, 1020 gms, 1140 gms,). The investigations of results are done graphically.

Keywords: Particulate Reinforced Al/SiC Metal Matrix Composites (PRALSICMMC), Silicon Carbide (SiC), Spark Gap Wg mm, Cutting Speed (Vc), Metal Removal Rate (MMR), Surface roughness (Ra), Peak Roughness (Rz).