

Surface Roughness of AlSi/10%AlN Metal Matrix Composite Material Using the Taguchi Method

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Abstract : This paper presents the surface roughness of the Aluminium silicon alloy (AlSi) matrix composite which has been reinforced with aluminium nitride (AlN), with three types of carbide inserts. Experiments were conducted at various cutting speeds, feed rates, and depths of cut, according to the Taguchi method, using a standard orthogonal array L27 (3⁴). The signal-to-noise (S/N) ratio and analysis of variance are applied to study the characteristic performance of machining parameters in measuring the surface roughness during the milling operation. The analysis of results, using the Taguchi method concluded that a combination of low feed rate, medium depth of cut, low cutting speed, and insert TiB₂ give a better value of surface roughness. From Taguchi method, it was found that cutting speed of 230m/min, feed rate of 0.4 mm/tooth, depth of cut of 0.5mm and type of insert of TiB₂ were the optimal machining parameters that gave the optimal value of surface roughness.

Keywords : AlSi/AlN Metal Matrix Composite (MMC), surface roughness, Taguchi method

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