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Optimization of Machining Parameters in AlSi/10%AlN Metal Matrix Composite Material by TiN Coating Insert

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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). Experiments were conducted at various cutting speeds, feed rates, and depths of cut, according to a standard orthogonal array L27 of Taguchi method using TiN coating tool of insert. The signal-to-noise (S/N) ratio and analysis of variance are applied to study the characteristic performance of cutting speeds, feed rates and depths of cut in measuring the surface roughness during the milling operation. The surface roughness was observed using Mitutoyo Formtracer CS-500 and analyzed using the Taguchi method. From the Taguchi analysis, it was found that cutting speed of 230 m/min, feed rate of 0.4 mm/tooth, depth of cut of 0.3 mm were the optimum machining parameters using TiN coating insert.

Keywords : AlSi/AlN metal matrix composite (MMC), surface roughness, Taguchi method, machining parameters
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