

High Speed Machining of Aluminium-Silicon Alloys - Influence of Cutting Parameters on Machinability

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ABSTRACT

Aluminium – Silicon alloy conforming to LM – 9 specification has been subjected to High Speed Face Milling operation at cutting speed from 800 mts/min to 3000 mts/min. PolyCrystalline Diamond (PCD) and uncoated carbide inserts are used for milling high silica aluminium under dry conditions. The cutting forces increases from 800 mts/min and then gradually tends to decrease up to 2800 mts/min and then starts increasing slowly with further increase in cutting speed up to 300mts/min. The flank wear of the tools is measured. The surface roughness (Ra) value was found to be 0.12 microns when machined with PCD tool & 0.36 micron (Ra), when machined with uncoated carbide. PCD was found suitable for machining high silica aluminium without coolant.

Keywords: Machining, high-speed and face milling