Effect of Lubrication Conditions to the Cutting Force Coefficients in Machining Process

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Abstract

The cutting force is the main important factor contributing the machined work piece surface and in determining the acceptable cutting parameters for high productivity in metal cutting industries. The prediction of cutting force coefficients of materials were calculated from the average cutting force model contributing to the constants of cutting force coefficients. In this study, experimental investigation is conducted to determine the cutting force coefficients in the average cutting force model, by identifying cutting force coefficients with different lubrication conditions such as dry, flood and minimal lubrication conditions and cutting speeds. A series of slot milling experiments are measured the milling forces by fixing the spindle speeds and radial/axial depths of cutting and linearly varying the feed per tooth. Using linearly fitting the experimental data, the tangential and radial milling force coefficients are then computed. The achieved results showed that the changing of spindle speed and different lubrication conditions affecting the milling force coefficient.