

# **Mathematical Modeling of Friction during High-Speed End Milling**

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## **Abstract**

Metal machining, due to its severe contact conditions during plastic deformation between the chips and the cutting tool has always been in the vanguard in developing models of friction. A better understanding of friction modelling is required to produce better realistic machining process to enhance goals of long span of cutting tool and better surfaces finish. The ability to accurately model and simulate end-milling process depends on the availability of genuine mathematical model. A major challenge in developing friction model for end milling operation is the difficult in acquiring dynamic stress- strain data and friction data respectively that accurate represent the end milling process. The aim of this work is to investigate effects of friction modelling at the chip tool work piece interfaces by analytical approach. The effect of cutting conditions and material behavior on sticking and sliding zones were also evaluated. It was established that the friction at the tool-chip interface strongly influences the normal stress, shear stress temperature and cutting speed.

## **Keywords**

Machining, Modelling, Friction