

Pattarapong Nipakul 2009: A Development of Mathematical Model for Surface Roughness Prediction Affected by Run-Out of Ballnose Cutting Tools. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Mr. Chana Raksiri, D.Eng. 196 pages.

The objective for this research is to study the effect of run out, offset misalignment and angular misalignment, by ballnose cutting tools in CNC milling machine. The mathematical model is developed for prediction cutting paths, milling surface geometry and surface roughness. The experiment to verify offset misalignment variable and angular misalignment variable effect to surface roughness are compared between simulation of milling process and manufactured by CNC milling machine.

The experiment results shown the adjustment of offset misalignment variable ( $\Delta R$ ) and angular misalignment variable ( $\theta$ ), the wide of cutting path is increased by run out adjustment but scallop height ( $h$ ) and roughness ( $R_a$ ) is reduced by run out adjustment. The trend of result of simulation of milling process is the same with manufactured by CNC milling machine. But scallop height ( $h$ ) and roughness ( $R_a$ ) for each run out adjustment have been different because the constraint of run out distance. The more run out distance the less cutting efficiency.

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Thesis Advisor's signature

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