

The Consequences of Vibrations in Machining

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Abstract : The formatting by removal of material remains an indispensable means for obtaining different forms of pieces. The objective of this work is to study the influence of parameters of the vibratory regime of the system PTM 'Piece-Tool-Machine, in the case of the machining of the thin pieces on the surface finish. As a first step, an analytical study of essential dynamic models 2D slice will be presented. The stability lobes will be thus obtained. In a second step, a characterization of PTM system will be realized. This system will be instrumented with accelerometric sensors but also a laser vibrometer so as to have the information closer to the cutting area. Dynamometers three components will be used for the analysis of cutting forces. Surface states will be measured and the condition of the cutting edge will be visualized thanks to a binocular microscope coupled to a data acquisition system. This information will allow quantifying the influence of chatter on the dimensional quality of the parts. From lobes stabilities previously determined experimental validation allow for the development a method for detecting of the phenomenon of chatter and so an approach will be proposed.

Keywords : chatter, dynamic, milling, lobe stability

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