Experimental approach of milling stability of thin walled parts, comparison with time domain simulation.

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Abstract

Nowadays, stability of machining operation is at the center of lots of studies. In fact, many industries like aeronautics, mold, automotive …, are confronted with problems of vibrations on their machined parts. Models and softwares have been developed in order to predict these phenomenon. But at present time, finishing operations of thin walled pieces are still difficult to model, particularly with ball-end mill. So in this study, tests have been made on two dimensions thin plates in TA6V in order to better understand what occurs dynamically. The cutting conditions are representative of those used in aeronautical industry for finishing operations on compressor blades. Results of this experimentation are presented for different types of vibrations: analyses of plates displacement and roughness profiles. Moreover, simulations of those experimental tests have been conducted using time domain model. As a matter of fact, this model is more accurratsed than the analytical approach in the case of finishing operation. The scheme of this modelization will be presented and comparison with experimental tests exposed.