

عنوان مقاله:

Cutting Force Modelling in End-Milling Operation of Titanium Thin-Walled Parts

محل انتشار:

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خلاصه مقاله:

Titanium alloys are widely used for aerospace thin-walled parts such as compressor or turbine blades, Frames, etc. However in production, titanium alloys are categorized as difficult to cut materials. In this study, the forces for end-milling are predicted by an efficient dynamic force modeler, in addition a geometric solid modeler (ACIS) is used in order to model the part, compute the chip load and update the part as the tool removes the material. In this way the interaction between tool and part is accurately simulated and also a mechanistic cutting force model is used and the results are predicted in different cutting conditions for the titanium thin walled parts. The experimental coefficient modelling method is developed for the formulation of theoretical cutting force by considering the specific cutting force coefficient. Also the specific cutting force coefficient and uncut chip thickness were used for the calculation of estimated force in end-milling in each direction. Cutting force coefficients are obtained from the horizontal slot cutting tests and these tests are repeated for different feed rates. The results present a good consistency with the real measured force by dynamometer and the simulated cutting forces by means of the mechanistic force model and also .ACIS solid modeler for the prediction of force in end milling operation

کلمات کلیدی:

Force modelling, End milling, Calibration tests, Titanium, Thin-walled parts

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