

عنوان مقاله:

Experimental Passive Suppression of the Regenerative Chatter Phenomenon by Variation of the Frequency and Amplitude of the Spindle Motor Excitation in Turning

محل انتشار:

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خلاصه مقاله:

The suppression of the regenerative chatter phenomenon in turning process via the variation of the frequency and amplitude of the spindle motor excitation is carried out in this research. A programmable inverter is employed for variable periodic excitation of the spindle motor. A set of turning experiments is designed and performed on a number of conical work pieces both in constant spindle speeds and variable spindle speeds. The work-piece material was 1.7224 steel. These experiments are carried out in different spindle speeds so that the stability lobes diagram could be achieved. The results showed that the passive variations of the spindle speed increase the critical depth of cut in higher spindle speeds, while in lower spindle speeds it is case sensitive. It also showed that the increasing of the excitation frequency reduces the critical depth of cut, while increasing the amplitude increases the critical chip thickness in lower spindle speeds and reduces that in higher spindle speeds. It is stated that by decreasing the feeding rate and spindle speed, higher thickeners can be observed during shear spinning process.

کلمات کلیدی:

Regenerative Chatter Suppression, Spindle Speed, Excitation Variation, Stability Lobes Diagram

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