عنوان مقاله:

Frequency analysis and optimization of a CNC machine tool bed based on material characteristics

محل انتشار:

اولین کنفرانس بین‌المللی مکانیک مواد و تجهیزات پیشرفته (سال: 1396)

تعداد صفحات اصل مقاله: 8

نویسندگان:

Ali Kamali - *MSc student, Kerman, graduated university of advanced technology of Kerman, P.O. Box ۷۶۳۱۸۱۸۳۵۶*

Mohammad Ali Sarfejoo - *MSc student, Kerman, graduated university of advanced technology of Kerman, P.O. Box ۷۶۳۱۸۱۸۳۵۶*

خلاصه مقاله:

One of the most important difficulties of machining is chattering and frequency loads which affect directly on the quality of a production. Dynamic loads mostly produce vibrations that cause lower precision and lower surface quality. In order to confront the phenomenon, two steps are needed to be followed: first, the dynamic load reasons and vibration source must be discovered and the second, the way of answering this happening must be presented. According to some researches, it was shown that machine tool beds are playing an important role to minimize or maximize the vibration produced by some reasons. In this study, first of all a CNC machine model FP4MB was chosen and it's bed, reverse engineered by some exact methods and in order to find out the frequencies and amplitudes of the vibration, in solidworks software, the machine tool bed designed and modeled. Therefore, the model imported to the Abaqus software to run a frequency analysis. The first five mode shape data were extracted and in order to optimize bed to vibrate less, a unit structure was designed. According to material characteristics, three different materials with an acceptable stiffness were used to investigate material affections on the new machine tool bed with new unit structure design.

کلمات کلیدی:

Finite element method, machine tool bed, frequency analysis, material characteristics, free vibrations

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/800256