Study of Deformations Field in the Working Zone of Vertical Milling Machine

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Abstract

© 2017 The Authors. Published by Elsevier Ltd. The paper examines the questions of the static elastic deformation development during the machining with milling machines. It discusses the issues of "machine - tool - instrument - workpiece"system modelling aiming at providing the preliminary assessment of elastic deformations during the processing, which gives an opportunity to prevent defect appearance. The deformation distribution is detected for the cases when the cutting area is positioned in different points of working area of the machine. The changes of deformations for different cutting pattern are analysed, a method of determination of main axes rigidity is considered based on that. The results show that the deformation of the technological system depends not only on the geometry of the basic parts and junctions but also on their location. The modelling the whole technological system is required. Only in this case selecting the optimal tool and its location to achieve the required quality of processing is possible.

Keywords

finite element analysis, machine tools, rigidity

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