

RIGIDITY ANALYSIS OF FIXTURE USING FINITE ELEMENT METHOD- AN APPROACH

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Abstract

Fixture are the workpiece holding & locating devices mounted on a machine .Fixture forms important part of machining for increasing production capacity of a machine. It is important to maintain the dimensional accuracy while enhancing production using the fixtures. The accuracy of machining while using the fixture depends on rigidity of fixture and the vibration cause at the time of machining. Hence it is important to have rigidity analysis of a fixture, to understand the extent of vibration generated. The finite element rigidity analysis of fixture used for CNC machine at Bajaj steel industry, Nagpur is discussed in this paper. The finite element analysis model of fixture of unit rigidity is developed with contact element to check rigidity of fixture. The effect of vibration on the natural frequency is examined .The fixture model is developed using CAD model & the drilling forces are predicted while considering material properties , drill parameters, tooth geometry , cutting condition etc. The paper proposes finite element method for the rigidity analysis of a fixture for its effective design. Pro-E and Ansys soft wares are used for development of model & its analysis.

Keywords: fixture, cutting forces, vibration, natural frequency, rigidity analysis, FEA

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