Vibration Characteristics of Thin Steel Plate under Magnetic Field Using Permanent Magnets (Study on Effect of Pole of Magnets)

by

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Abstract

In this study, an examination of the vibration characteristics of a thin steel plate under a magnetic field produced using permanent magnets was carried out. In particular, the effects of the pole and arrangement of the magnets were considered. On the basis of the results of the fundamental study using a single degree of freedom model, examination of a steel plate was performed. The magnetization curve used in the analysis was measured by the ring specimen method. The attractive force of the permanent magnets is analyzed by the finite element method and the elastic vibration of the steel plate was calculated by the finite difference method. To verify the usefulness of the permanent magnet system, experiments were performed for an elastic steel plate. As a result, it was confirmed that the permanent magnets could increase the damping factor of the elastic vibration of the steel plate.

Key Words : Permanent Magnet, Steel Plate, Damping, Elastic Vibration, FEM

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