

# RESEARCH ON MAGNETOMECHANICAL COUPLING RELATION IN AMORPHOUS METAL CORE TRANSFORMERS

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## Abstract:

The magnetostrictive force is a major cause of noise and vibration from a transformer. Especially, the magnetostrictive force of an amorphous steel core transformer is higher than that of a silicon steel core transformer. In order to accurately calculate and evaluate the noise and vibration of a transformer, it is necessary to fully examine such factors as deformation, displacement, vibration and magneto-mechanical force. In this paper a generalized mathematical model was set up with the above factors taken into consideration. The mathematical model was then developed on a single-phase amorphous steel core transformer with a capacity of 3,3kVA-220V/115V to result in the degrees of deformation and vibration in cases without clamped iron for magnetic legs and yokes. At the same time, these results were evaluated and compared with experimental ones, which helps determine a reasonable clamping force to minimize the noise and vibration of the amorphous steel core transformer.

*Key words: Transformer; Amorphous; Vibration; Audible noise; Magnetostriction; Magnetomechanical.*