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## **Wed-Af-Po3.22-02 [80]: Effect of Specimen Shape on Eddy Current Distribution in Large Single Sheet Tester**

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Laminated silicon steel sheet, which is widely applied in electrical engineering, such as cores of power transformer and electrical machines, usually suffer from stress caused by a quantity of factors such as non-uniform clamping forces, wavy laminations, or temperature gradients. Therefore, the measurement of magnetic properties under stress is important. A remarkable number of works demonstrate that the large single sheet tester (SST) is suitable for applying stress and the problems related to the large SST are discussed in detail. However, the development of large SST is restricted by the defect that the systematic error was high and, in the worst case, reach up to 28%, which is attributed to the flux penetration into the specimen causes additional eddy current loops closing in the specimen's plane. In this paper, the effect of specimen shape on eddy current distribution in large SST are mainly evaluated by numerical analysis and experimental comparison of different shapes of cross-shape specimen under various yoke constructions. The additional eddy current closed loops in the specimen's plane will be cut off by the means of slotting in the specimen. Three kinds of SST construction are applied to test different shapes of samples and losses of each specimen are compared and analyzed. The results demonstrates that slotting is beneficial to decrease the additional eddy current loss and increase the measurement accuracy.

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