

The measurement of core losses in electrical steel laminations is considered an essential step in the machine design process. Accordingly, the calibration of the tangential field sensor for measurements of magnetic field strength H is of importance in core loss measurements for estimation of electrical machine efficiency. Due to the stray field between the lamination surface and the tangential coil, a concern is raised regarding the certainty of the measured field. This paper presents a reliable technical approach to calibrate the tangential field sensor used in the investigation of core losses in electrical machine laminations, which compensates for the drop in the actual field value. The proposed approach is based on developing a magnetizing circuit, which consists of two test laminations. An array of Hall Effect sensors is used in this study as a reference for the tangential field. The calibration results show that the magnetic field strength measured at the specimen surface by the tangential coil is scaled down by 4.57% of the actual field. The results are verified experimentally and validated by finite-element simulations. Based on the obtained results, a correction factor is applied on pulsating and rotational core losses to attain more accurate data.