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Confirming Quality in Nanocrystalline Material with Core Loss

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Nanocrystalline material has become one of the most efficient and prolific materials for use in high-frequency pulse transformers. Nanocrystalline cores successfully bridge the gap between laminated steel and ferrite with high saturation and low loss, however, the cost and quality of the material is variable. The manufacturing and quality control procedures of the material has a direct impact on the core loss. MK Magnetics is constantly developing improved core manufacturing procedures with nanocrystalline material and a variety of other standard materials. At Stangenes Industries an experiment was devised to test core loss in two of the industry-available nanocrystalline materials used at MK Magnetics. Two cores of similar size were manufactured with an identical annealing process, only differing the core material. The cores were then tested at range of frequencies to compare core loss. This data is used used to confirm quality as well as experimentally verify a commonly used equation for core loss in nanocrystalline cores. An expanded variety of core materials could be subjected to the same test procedure to both verify the quality and serve to update core loss charts constructed around less accurate test methods.

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