Influence of Inner Demagnetizing Field on Energy Loss in NiFeMo Compacted Powder

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Abstract. Powder compacted soft magnetic materials are a specific group of materials of remarkable application potential. Nowadays they have been intensively studied by materials scientists to improve magnetic properties of these materials. The paper describes a demagnetizing field influence on energy loss and its components in NiFeMo compacted powder prepared by an innovative method of smoothing the surfaces of individual particles. On the one hand, it is well known that demagnetizing field does not influence the value of some magnetic quantities such as coercivity, saturation magnetization and total energy loss. On the other hand, such quantities as remanent magnetization and magnetic permeability are strongly dependent on demagnetizing field when they are considered in external magnetic field. Correct values of these quantities are obtained only when they are considered in internal field (the influence of demagnetizing field is excluded). The objective of this paper is to evaluate whether the demagnetizing field influences the low and high energy loss separation in accordance with the Landgraf's theory leading to better understanding of magnetization processes performed by domains wall displacement and magnetization vector rotation.