

Accepted Manuscript

The impact of bending stress on magnetic properties of Finemet type microwires and ribbons

E. Shuvaeva, S. Kaloshkin, M. Churyukanova, A. Perminov, I. Khriplivets, A. Mitra, A.K. Panda, R.K. Roy, Premkumar, V. Zhukova, A. Zhukov



PII: S0925-8388(18)30445-6

DOI: [10.1016/j.jallcom.2018.02.015](https://doi.org/10.1016/j.jallcom.2018.02.015)

Reference: JALCOM 44891

To appear in: *Journal of Alloys and Compounds*

Received Date: 30 July 2017

Revised Date: 1 February 2018

Accepted Date: 2 February 2018

Please cite this article as: E. Shuvaeva, S. Kaloshkin, M. Churyukanova, A. Perminov, I. Khriplivets, A. Mitra, A.K. Panda, R.K. Roy, Premkumar, V. Zhukova, A. Zhukov, The impact of bending stress on magnetic properties of Finemet type microwires and ribbons, *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2018.02.015.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The Impact of Bending Stress on Magnetic Properties of Finemet Type Microwires and Ribbons

E.Shuvaeva¹, S. Kaloshkin¹, M.Churyukanova¹, A. Perminov¹, I.Khriplivets¹, A.Mitra²,
A.K.Panda², R.K.Roy², Premkumar², V.Zhukova³, A.Zhukov^{3,4}

¹National University of Science and Technology "MISIS", Moscow, Russia

² CSIR-National Metallurgical Laboratory, Jamshedpur, India

³ Dpto. Fisica de Materiales, UPV/EHU, San Sebastian, Spain

⁴IKERBASQUE, Basque Foundation for Science, Bilbao, 48011 Spain

*Corresponding author e-mail: shuvea@mail.ru

Abstract

In our research we studied the influence of bending on the total magnetic losses, the coercivity of minor hysteresis loops and the virgin magnetization curves of amorphous ribbons and microwires prepared from Finemet-type alloy wound on a mandrel of different diameters. The impact of various factors contributing on static and dynamic magnetic properties through bending stress are discussed. The factors pertain to contribution of the magnetoelastic anisotropy, the onset of the strain-induced magnetization, the changes of domain structure and the mobility of domain walls. The major contribution of hysteresis losses as-compared to the eddy-current losses have been observed on changing the mandrel diameter in wound ribbons and wires. The total specific losses of the Finemet-type ribbons are lower than that of microwires at the frequencies ranging from 50 to 400 Hz. Observed difference in the magnetic properties is attributed to different magnetization processes of amorphous microwires and ribbons. A different geometry and magnetoelastic anisotropy of studied materials are most likely to influence the formation of different domain structures.

Keywords: magnetic glass-coated microwires, amorphous materials, soft magnetic properties, total magnetic loss.

1. Introduction

The searching of "energy-efficient materials and systems" is one of the most promising research fields of material science, in which the development of transformer core materials with

Download English Version:

<https://daneshyari.com/en/article/7993225>

Download Persian Version:

<https://daneshyari.com/article/7993225>

[Daneshyari.com](https://daneshyari.com)