

High Permeability Properties of Amorphous Co-Fe Base Alloys

著者	FUJIMORI Hiroyasu, KIKUCHI Michio, OBI Yoshihisa, MASUMOTO Tsuyoshi
journal or publication title	Science reports of the Research Institutes, Tohoku University. Ser. A, Physics, chemistry and metallurgy
volume	26
page range	294-294
year	1976
URL	http://hdl.handle.net/10097/27872

is a typical soft ferromagnet with low coercive force. Application of tensile stress increases the remanence up to about 0.92 times the saturation magnetization. Twisting of the specimen results in the complete squareness of the hysteresis loop. By annealing, the effect of tensile stress on the magnetic properties can be stabilized permanently. A high permeability of the amorphous alloy is obtained by magnetic field-annealing.

Magnetostriction of Fe-Co Amorphous Alloys

Hiroyasu FUJIMORI, Ken Ichi ARAI, Hisanori SHIRAE, Hideo SAITO, Tsuyoshi MASUMOTO and Noboru TSUYA

Japan. J. Appl. Phys., **15** (1976), 705.

Longitudinal and transversal magnetostrictions of rapidly quenched amorphous alloys in $(\text{Fe}_{1-x}\text{Co}_x)_{80}\text{P}_{13}\text{C}_7$ and $(\text{Fe}_{1-x}\text{Co}_x)_{75}\text{Si}_{15}\text{B}_{10}$ systems were measured in the saturation magnetization region at room temperature. Forced magnetostrictions of these alloys were also measured in the magnetic field up to 23 kOe. A three-terminal capacitance method and a modified dilatometric method of a suspension type were employed for the measurements. The magnetostriction constant obtained by multiplying a factor 2/3 by the difference between the longitudinal and transversal magnetostrictions is zero in the alloy with $x=0.94$, being positive in the range of $0 < x < 0.94$ and negative in the range of $x > 0.94$. This fact accounts for the remarkable low coercive force and high permeability of the alloy with $x=0.94$. The forced volume magnetostriction has been obtained to be about 23×10^{-10} in the alloy with $x=0$; it decreases monotonically with increasing x .

High Permeability Properties of Amorphous Co-Fe Base Alloys

Hiroyasu FUJIMORI, Michio KIKUCHI, Yoshihisa OBI and Tsuyoshi MASUMOTO

J. Japan Inst. Metals, **41** (1977), 111.

Amorphous alloys of $(\text{Fe}_{1-x}\text{Co}_x)_{80}\text{P}_{13}\text{C}_7$ and $(\text{Fe}_{1-x}\text{Co}_x)_{75}\text{Si}_{15}\text{B}_{10}$ were prepared by rapid quenching from the melt by using two solidification techniques of centrifugal and roller types. Specimens were ribbons in form. Measurements were made of B-H hysteresis loop, effective permeability at high frequencies, longitudinal magnetostriction, electrical resistance, Vickers hardness and tensile strength.

The magnetostriction is zero at a composition near $x=0.94$, being positive in the range of $0 < x < 0.94$ and negative in the range of $x > 0.94$. The alloy of $\text{Fe}_{4.7}\text{Co}_{70.3}\text{Si}_{15}\text{B}_{10}$ having a nearly zero magnetostriction exhibits the best soft magnetic properties; the coercive force is 0.006 Oe and the maximum permeability is about 820×10^3 after annealing at 150°C in a magnetic field. In addition, this alloy has a high effective permeability at higher frequencies up to about 100 kHz, high hardness and high tensile strength.