

**THE INFLUENCE OF LENGTH AND TENSILE STRESS ON
THE MAGNETIC PROPERTIES OF PRE-TREATED
AMORPHOUS FE-BASED WIRES**

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Dynamic magnetic properties of the $F_{75}Si_{10}B_{15}$ amorphous metal wires were studied. Diameter of the wires was 140 microns. The length l of the samples ranged from 0.02 to 0.1 m. The pretreatment of the wires by dc with densities j up to 6.5×10^7 A/m² was carried out in air for 2 minutes. Dynamic magnetic parameters were measured by induction method. The frequency of reversal field was varied in the range of $0.5 \div 10$ kHz. Elastic tensile stresses σ in the range of $(4 \div 130) \times 10^6$ Pa were applied to the wires in the measurement process. Two clearly defined parts were observed on the curves of the residual induction depending on the length $B_r(l)$. On the first part of the curve the value of B_r increases with augmenting length from 0.02 up to 0.06m. On the second part of the curve the value of B_r is almost independent of the length ($l > 0.06$ m). The maximum changes of the magnetic permeability, coercive force and B_r under the influence of σ were observed for the wire with a length less than 0.06 m. This result indicates that the core of the wire goes into single-domain state with increasing lengths of wire more than 0.06 m.

9.7 cm

13.4 cm

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