

Magnetic Properties of Multi-Layered Metallic Ribbons

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Abstract. The method of planar flow casting has been used for preparation of single-, bi- and tri-layered ribbons of the two different or the same composition to attain multi-layered ribbons suitable for an application. Prepared bilayer was composed of positively and negatively magnetostrictive layers $\text{Fe}_{77.5}\text{Si}_{7.5}\text{B}_{15}/\text{Co}_{72.5}\text{Si}_{12.5}\text{B}_{15}$. Other aim was to suppress potentially undesired surface effects of differences between ribbon surfaces and volume. We prepared the ribbons with composition $\text{Co}_{47}\text{Fe}_{21}\text{Mo}_{6.5}\text{B}_{21}\text{Si}_{4.5}$ as single layer and trilayer with the thickness ratio more than 3:1. Structural, chemical and magnetic properties in amorphous (as-cast) and crystalline state were investigated. The composition was chosen to obtain low saturation magnetostriction. Nanocrystallization improved soft magnetic properties namely for trilayer. Work proved that reduction of large surface/volume ratio enables to reduce undesired effects of shrinking surfaces that squeeze the small volume of a single ribbon more efficiently.