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Enhanced High Temperature Mechanical Behavior of FeCo-Based Alloys ROBERT CAMMARATA, Johns Hopkins University, DEZHI ZHANG, Chinese Academy of Sciences, CHIA-LING CHIEN, Johns Hopkins University — FeCo alloys have been used for a variety of soft magnetic material applications, including for use in high temperature engine applications. However, inferior mechanical properties, in particular relatively low creep resistance, can limit their use at elevated temperatures. We have investigated a variety of microstructural engineering approaches to improve the creep resistance without significantly degrading the magnetic properties. Two such approaches will be discussed: oxide dispersion strengthening and annealing treatments leading to grain growth and precipitation hardening. We have shown that both of these methods allow for sensitive control of the resulting microstructural evolution. This control in turn allows for substantial improvement in both the room temperature yield strength as well as the high temperature creep resistance. Detailed microstructural characterization as well as tensile and testing results will be presented.

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