

Microstructure and Magnetic Properties of (Nd,Dy)FeB and (Nd,Pr)FeB Strips

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In this paper, we investigate the effect of Dy and Pr substitution for Nd on the microstructure and the magnetic properties of Nd-Fe-B alloys fabricated by using the strip-casting process. The addition of Dy and Pr changes the melting temperature of the strips, which results in differences in undercooling during solidification. The alteration of undercooling induces variations in the nucleation frequency and the cooling rate in the strips and changes the grain size and alignment. These microstructural changes have a large effect on the coercivity of the strips. The addition of Dy improves the coercivity of the strips due to the presence of more refined and well-oriented grains, which is attributed to the high thermal gradient. The addition of Pr to strips with a low thermal gradient reduces the coercivity due to the large grain size.

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