

## Dependence of microstructure and magnetic properties of (Nd,Pr)-(Fe,Ti,C)-B melt-spun ribbon on quenching wheel speed

### ABSTRACT

Melt-spun ribbons with nominal composition of Nd<sub>6</sub>Pr<sub>1</sub>Fe<sub>76</sub>B<sub>12</sub>Ti<sub>4</sub>C<sub>1</sub> have been prepared at different quenching wheel speeds (5, 7.5, 10 and 15 m/s) and investigated for microstructural and magnetic properties. The as-spun ribbons were examined by using x-ray diffractometry (XRD) with Cu-k radiation and differential scanning calorimetry (DSC) and vibrating sample magnetometry (VSM). Based on the results obtained, it was shown that the lower speeds increased the magnetic properties. Hence, a uniform Nd<sub>2</sub>Fe<sub>14</sub>B/Fe<sub>3</sub>B nanocomposite structure with fine soft grains can be developed at an optimum quenching wheel speed of about 5 m/s. Further, it is seen that the higher quenching wheel speed leads to a lower grain size and higher amorphous phase amount.

**Keyword:** Nanocomposite; Nd-Fe-B; Rapid solidification