

## Microstructural and Magnetic Properties of Ni<sub>50</sub>Mn<sub>39</sub>Sn<sub>11</sub> and Ni<sub>50</sub>Mn<sub>36</sub>Sn<sub>14</sub> Heusler Alloys

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**Abstract :** We report the microstructural and magnetic properties of Ni<sub>50</sub>Mn<sub>39</sub>Sn<sub>11</sub> and Ni<sub>50</sub>Mn<sub>36</sub>Sn<sub>14</sub> ribbon Heusler alloys. Experimental results were obtained by differential scanning calorimetry, X-ray diffraction and vibrating sample magnetometry techniques. The Ni-Mn-Sn system undergoes a martensitic structural transformation in a wide temperature range. For example, for Ni<sub>50</sub>Mn<sub>39</sub>Sn<sub>11</sub> the start and finish temperatures of the martensitic and austenite phase transformation for ribbon alloy were  $M_s = 336\text{K}$ ,  $M_f = 328\text{K}$ ,  $A_s = 335\text{K}$  and  $A_f = 343\text{K}$  whereas no structural transformation is observed for Ni<sub>50</sub>Mn<sub>36</sub>Sn<sub>14</sub> alloys. Magnetic measurements show the typical ferromagnetic behavior with Curie temperature 207K at low applied field of 50 Oe. The complex behavior exhibited by these Heusler alloys should be ascribed to the strong coupling between magnetism and structure, being their magnetic behavior determined by the distance between Mn atoms.

**Keywords :** as-cast ribbon, Heusler alloys, magnetic properties, structural transformation

**Conference Title :** ICMTM 2015 : International Conference on Metallurgy Technology and Materials

**Conference Location :** Berlin, Germany

**Conference Dates :** May 21-22, 2015