

Production and theoretical simulation of performance of metal-bonded $\text{La}(\text{Fe},\text{Mn},\text{Si})_{13}\text{H}_x$ composite material

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Hydrogenated $\text{La}(\text{Fe},\text{Mn},\text{Si})_{13}$ based alloys have excellent magnetocaloric properties but poor mechanical and chemical stability. In this work we show how machinability and corrosion protection of the particles can be improved by a hot-dip coating. The metal coated particles were used to build two different types of heat exchangers: stacked flat plate and packed bed of spherical particles. Further a theoretical comparative investigation of the performance of two heat exchangers geometries, using the similarity theory, combined with unsteady heat transfer approach, is presented.

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