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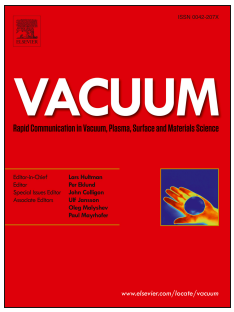

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Multi-layer functional graded stainless steel fabricated by laser melting deposition

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Abstract

In this study, a stainless steel graded material was successfully fabricated by laser melting deposition technology. The influence of a composition gradient on the microstructure and properties of the as-deposited part was studied. The microstructure, constituent phases, elemental composition and microhardness of the stainless steel graded part were investigated using OM, SEM, EDS, XRD and microhardness tester, respectively. Experimental results showed that good metallurgical bonding could be obtained between the as-deposited part and the substrate. The as-deposited microstructure consisted mainly of columnar dendrites, growing along the deposition direction. In addition, there were also some equiaxed dendrites in the top region of the part. It could be verified utilizing XRD that the part exhibited a series of phase transformations along the gradient direction. The phase transformations within the

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