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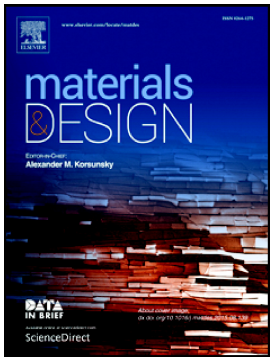

Manufacturing of FeCoCrNiCux medium-entropy alloy coating using laser cladding technology

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Manufacturing of $FeCoCrNiCu_x$ medium-entropy alloy coating using laser cladding technology

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Abstract: In the present research, $FeCoCrNiCu_x$ medium-entropy alloy coatings were manufactured on Cr12MoV die steel by laser cladding technology. Due to the dilution effect of the substrate, the actual mixed entropy value of the coatings was found to be less than the theoretical value, indicating a typical medium-entropy alloy. The addition of Cu element was found to increase the Gibbs free energy of the cladding layers. Moreover, the difference in atomic radius between the Cu element and the other four elements is large. Thus, the Cu element segregates easily at the grain boundaries. The micro-hardness of the cladding layers was lower for the simple face-centered cubic structure, about 250HV. Owing to the low hardness value, the