

Influence of heat treatment on microstructure and tribological properties of flame spraying Fe-Ni-Al alloy coating

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Description

The Fe-based coatings in powder form were deposited on a steel type E335 by flame spraying technique. The effects of the post heat treatment on the microstructure and the mechanical properties of sprayed coatings were studied. Post heat treatment was conducted in a furnace in air at 623 K, 823 K and 1023 K for 1 h and then cooled in air. The results showed that with the increase of annealing temperature, the microstructure of coating treated at 823 K and 1023 K had several changes as follows: the reduction of porosity, formation of carbides and oxides. It was found that the solid solution FCC (Fe, Ni), intermetallic compound AlFe_3 and carbides [Fe, C] were the main phases for coatings as-sprayed and treated at 623 K and while iron carbide, molybdenum carbide and oxide as Fe_3O_4 became the main phases and reinforced the solid solution FCC (Fe, Ni) phase for annealed coatings at 823 K. However ...