

Increased liquid droplet erosion resistance of steam turbine blades

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Abstract

Alloys used for the blades of steam turbines usually do not show a satisfactory resistance to erosion and require surface protection with suitable coatings. Starting from results obtained with Stellite 6 coatings on AISI 420 stainless steel blades, this research has been developed with the aim to increase erosion resistance by modifying the chemical composition of the coatings. Several samples have been coated by laser cladding and exposed to liquid erosion tests. In particular, concentrations of carbide-forming and solid solution strengthening elements have been varied, in order to establish their effects against liquid droplet erosion. Results of the tests and EDX analyses on the samples are reported, with a discussion on the various effects on erosion resistance. Two directions have appeared as the most promising, either increasing the concentration of carbide-forming elements, or that of Nickel.