

Laser shock peening of AISI 304 stainless steel for the application to seawater desalination pump components

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ABSTRACT

The enhancement of abrasion and corrosion resistance of AISI 304 stainless steel by laser shock peening (LSP) is reported. The optimal process conditions to achieve maximum surface hardness were determined to be laser intensity of 10 GW/cm², pulse density up to 25 pulse/mm², and 100 μm thick Al foil as the protective coating. As a result of laser shock peening, the wear volume and corrosion rate decreased by 50% and 86%, respectively, from those of unpeened material. It is considered that significant reduction in maintenance cost and extension of life time of pump components can be achieved by properly applying LSP on seawater desalination pump and pump components.

Keywords: Desalination pump; Laser shock peening; Hardness; Wear; Corrosion

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