

## Effect of Nitriding and Shot Peening on Corrosion Behavior and Surface Properties of Austenite Stainless Steel 316L

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**Abstract :** This research aims to study the effect of the liquid nitriding and shot peening on the hardness, surface roughness, residual stress, microstructure and corrosion behavior of austenite stainless steel 316 L. Chemical surface heat treatment by liquid nitriding process was carried out at 500 °C for 1 h and followed by shot peening with using ball steel diameter of 1.25 mm in different exposure time of 10 and 20 min. Electrochemical corrosion test was applied in sea water (3.5% NaCl solution) by using potentostat instrument. The results showed that the nitride layer consists of a compound layer (white layer) and diffusion zone immediately below the alloy layer. It has been found that the mechanical treatment (shot peening) has led to the formation of compressive residual stresses in layer surface that increased the hardness of stainless steel surface. All surface treatment (nitriding and shot peening) processes have led to the formation of carbide of CrN in hard surface layer. It was shown that both processes caused an increase in surface hardness and roughness which increases with shot peening time. Also, the corrosion results showed that the liquid nitriding and shot peening processes increase the corrosion rate to values more than that of not treated stainless steel.

**Keywords :** stainless steel 316L, shot peening, nitriding, corrosion, hardness

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