

Study of Phosphate Formation on S355J2 HSLA Steel

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In present paper, the growth process of the phosphate coating on S355J2 steel was investigated. The microstructure, surface morphology, coating thickness, surface roughness and corrosion resistance of the phosphate coating were analysed by using several techniques including light microscopy, confocal laser scanning microscopy (CLSM) and electrochemical tests - electrochemical impedance spectroscopy (EIS) in 0.1M Na₂SO₄ solution (simulation of industrial atmosphere). The phosphate coating formation was evaluated after chosen exposure times from 15 minutes to 105 minutes in phosphating bath composed of MnO₂, H₃PO₄ and demineralised H₂O. The optimal exposure time of S355J2 steel in selected phosphate solution was determined from surface quality, corrosion resistance and energy consumption point of view.

Keywords: steel S355J2, manganese phosphate, corrosion resistance

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