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Impact of Welding Wire Nickel Plating Process Parameters on Ni Layer Thickness

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Abstract : The article presents part of research on the development of nickel plated welding wire production technology, whose application will enable the elimination of the flaws of currently manufactured welding wires. The nickel plated welding wire will be distinguished by high quality, because the Ni layer which is deposited electrochemically onto it from acid baths is characterized by very good adhesion to the steel wire surface, while the ductile nickel well deforms plastically in the drawing process and the adhesion of the Ni layer increases in the drawing process due to the occurring process of diffusion between the Ni and the steel. The Ni layer obtained in the proposed technology, despite a smaller thickness than when the wire is coated with copper, is continuous and tight, thus ensuring high corrosion resistance, as well as unsusceptible to scaling, which should provide a product that meets requirements imposed by the market. The product will also reduce, to some extent, the amount of copper brought in to steel through recycling, while the wire coating nickel introduced to the weld in the welding process is expected, to a degree, to favorably influence its mechanical properties. The paper describes the tests of the process of nickel plating of f1.96 mm-diameter wires using various nickel plating baths with different process parameters.

Keywords : steel wire, properties, welding process, Ni layer
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