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INFLUENCE OF ZINC POWDER CHARACTERISTICS ON THICKNESS AND CORROSION RESISTANCE OF DIFFUSIVE ZINC LAYER

Background. *Quantitative dependences of thickness and corrosion resistance of a diffusive zinc layer on zinc powder characteristics have been studied.*

Materials and/or methods. *The diffusion zinc coating of low-carbon steel samples was carried out in the mixture containing 10 and 30 % of zinc powder, 2 % of ammonium chloride and siliceous sand. The structure and thickness of the coated layer was examined by metallographic method. Corrosion properties of the samples were tested in-situ. To increase corrosion resistance passivation in various reactants was applied.*

Results. *With the increase of the size of zinc powder main fraction from 0.06 to 0.16 mm the thickness of a diffusive layer increases at least twice. At the same time the surface roughness increases 2...3 times. When using even coarser zinc powder corrosion resistance of the coating increases 3...4 times.*

Conclusion. *The increase of zinc powder fractions contributes to the diffusive layer thickening. It is explained by peculiarities of the diffusive layer formation at which zinc is transferred to the product surface in the liquid phase. The increase in the zinc impurity content reduces its melting temperature, which facilitates diffusive layers thickening. Zinc coating in the mixture with large-fraction powder results in the increase of corrosion resistance. It may be connected with a higher zinc content in the intermetallide layer. Passivation in the solutions containing chromic acid allows one to considerably increase corrosion resistance of the zinc-coated surface.*

Keywords: *diffusion zinc coating, intermetallide layer, corrosion resistance.*

Bibliographic reference:

Krymov V.N. *Vliyanie kharakteristik tsinkovogo poroshka na tolshechinu i korrozionnuyu stoykost' diffuzionnogo tsinkovogo sloya* [Influence of zinc powder characteristics on thickness and corrosion resistance of diffusive zinc layer]. *Metallurgical processes and equipment*, 2013, No.1, pp. 6-11.