

Characteristics of the Phosphate Coating on Zinc Coated Steel Sheets

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Abstract

Recently, various kinds of zinc coated steel sheets have been increasingly applied to car bodies for the improvement of cosmetic corrosion and perforation corrosion, and the amount of their use has increased.

For the upgrading of paint performance on zinc coated steel sheets, phosphating chemicals have been switched to Ni-Mn-F type from Ni-ClO₃ and Ni-F type in Japan.

In this paper, important characteristics of phosphate coating treated with phosphate solution containing Ni²⁺ and Mn²⁺ are studied, and also the effect of this Ni-Mn-F type coating on paint adhesion and corrosion resistance is investigated.

As a result of this study, it has been made clear that alkaline resistance of phosphate coating depends on the amount of Ni and Mn in the coating. Consequently alkaline resistance of coating correlates to its paint adhesion.

It is conceived that Ni in the coating affects corrosion resistance of zinc coated steel sheets. In regard to this effect, it is discussed that the protective corrosion layer, [4Zn(OH)₂ZnCl₂] is formed on zinc coated steel sheets and its layer gives good corrosion resistance.

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