Spatial Distribution of Thickness Measure of Electrostatic Powder Coating on Irregular Surfaces

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Abstract: The quality aim in an industrial electrostatic coating process is subject to the interaction of the set of coat material particles with the electric field and the characteristic parameters of the process. When the surface to be covered is irregular, the effects of the electric fields in depressed regions or at vertices hinder to obtain the required results of appearance and thickness at these regions. The cause of this is the Faraday cage effect, which is inherent to the electric field generation on irregular surfaces and its removal is not possible. For this reason, different researches have been done to find options to minimize the negative consequences of Faraday cage effect. In this work different tests of painting with electrostatic powder using different parameters are presented; the thickness of the final coating paint is measured and a spatial variation of its coating thickness measured on uneven surfaces analysis is performed, also the experiment results are related to the electrostatic field intensity measurements, which were obtained by simulation with the finite element method to establish the importance of the electric field as a parameter of process.

Keywords: Electric Field, Faraday Cage Effect, Thickness Coating