Influence of Modern Ways of Metallic Coatings Application and their Optimization for Quality of Parts Used in Car Industry

by

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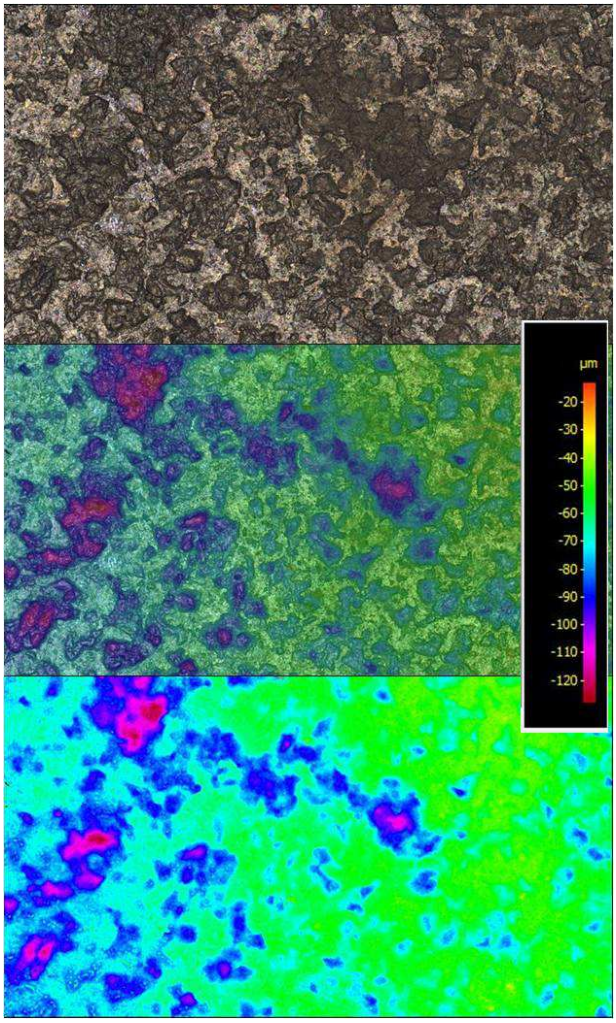

2016

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Scientific monograph

2016

RAM-Verlag

ABSTRACT

In the first case various areas of roughness were created the surface of which was finished. After evaluation of the given test we can state that the roughness of the basic area influences the acquired layer but does not influence the corrosion resistance.

Chemical grease removal is an important part of the surface finishing process. The zinc surface finishing was applied on the stabilized parts but one process of chemical grease removal was left out. After the salt spray test was performed it is possible to conclude that chemical grease removal affects the overall surface finishing.

During the finishing the parts are hanging on suspenders. In some cases metal material suspending equipment is used. Base on the acquired results metal suspending equipment influence the thickness of the applied layer.

Chemical composition is another factor affecting the thickness of the applied layer. It is caused by conductivity of the given materials and other alloys.

Cyclical corrosion tests and thermal shock tests showed that the production process of zinc and zinc-nickel electrochemical surface finishing provide sufficient surface quality of the plated part.

Another examined factor, which influences the surface finishing quality, is the way of suspending of the parts during the production. Experiments proved that arrangement of parts in the electrolytic bath affects the thickness of the applied layer.

The results show that the examined factors can influence the quality of surface finishing and mainly the corrosion resistance of parts in the car industry.

Key words: surface finishing, corrosion, salt spray, thermal shock.

Reviewers: Prof. Jan PASKO, M.Sc., PhD.
Dr.h.c. Prof. Ján MAREČEK, DrSc.

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This scientific monograph was created with financial support of the grant project KEGA no. 035SPU-4/2014 "Integrating innovative trends in metal machining, metrology and quality management in university studies".

ISBN 978-3-942303-40-8

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INTRODUCTION

Improvement of technical level, utility value, quality and reliability of mechanical engineering products are the main directions of economy. Materials and products made of these materials are during their entire lifetime exposed to environmental influences and functional stress where we require the stability of their original qualities and appearance. Reduction of lifetime and loss of reliability are often caused by deterioration of the material surface, particularly by the corrosive effects and wear.

Corrosion is a spontaneous gradual disruption of metals or non-metallic organic or inorganic materials caused by chemical or electrochemical reaction with the surrounding environment. It can occur in the atmosphere or in other gases, water and other liquids, soils and various chemical substances which come into contact with the material. Corrosion is manifested by change of appearance, gloss loss and firmness loss. It is very common for iron and steel (screws, nuts, sheet metals, wires). It is caused by heat, humidity, air oxygen.

The purpose of surface finishing is to acquire the required qualities and condition of material surface which are necessary for their optimal long-term function. An appropriate surface preparation ensures the sufficient adhesion of the final coating, uniform appearance of the final finishing and its good corrosion and wear resistance.

In the present economic time saving of resources is always welcomed. The appropriate surface finishing ensures the lifetime of the parts what can prevent their damage and replacement.

In the mechanical engineering production a great emphasis is nowadays put on the providing of some invariable parameters of the parts. There is an effort to ensure their long-term functionality and avoid the degradation processes caused primarily by climatic influences of the environment. Corrosion aggression is the most dreaded phenomenon.

Majority of parts in the car industry is finished by zinc or zinc-nickel electrochemical methods which are characterized by the best qualities for corrosion protection. Corrosion protection is one of the most significant characteristics of components in the car industry.