

INCREASE IN CORROSION RESISTANCE OF ARTICLES MADE OF STRUCTURAL STEELS BY THE ACTION OF THE PULSATORY GAS FLOW

Ivanov D.A.

St. Petersburg state university of civil aviation
Saint Petersburg, Russia
St. Petersburg state economic university
Saint Petersburg, Russia

Abstract: Corrosion resistance can be increased not only by the use of coatings, protectors or by introduction of the expensive alloying additives, but also by mechanical processing.

Keywords: corrosion resistance, machine part, the gas-pulse working.

The problem of increasing corrosion resistance of articles made of structural steels by the significant depth is posed before the invention. Invention realizes as follows: articles made of structural steels subject in the plenum chamber of the generating fluctuations installation, to the action of the pulsatory subsonic air flow, which has frequency 600-1000 Hz and sound pressure 120-140 dB at a temperature, which corresponds to the value of the temperature in the plenum chamber, lowered relative to air jet room because of the cooling with the expansion, being located in the range from -10° C to $+1^{\circ}$ C. Dislocation density determines the properties of metallic material. Influencing on the dislocatory structure, the mechanical waves, generated by the pulsations of gas flow, have an effect on its properties, including corrosion resistance. Thus, the models of cylindrical form with a diameter 20 of mm made of steel of 12KhN, used for preparing the gears, it is finger and other critical components, which work in the conditions of impact and alternating loads, they were processed in the plenum chamber during 12 the minutes by the pulsatory subsonic air flow, which possesses the prevailing frequency of the order 900 of Hz and sound pressure to 130 dB at a temperature, which corresponded to the value of the temperature in the plenum chamber, lowered relative to the room because of the cooling with the expansion of air jet, and which was approximately -1° C. In parallel was accomplished working models by the pulsatory gas flow with the amplitude-frequency characteristics, which correspond to prototype.

Tests for corrosion resistance were accomplished by a way of sinking the models in 4%- ache the aqueous solution Of HCl on 15 twenty-four hours with the intermediate control of a change in the mass, the maximum loss by which comprised more 3%. In the case of the models, subjected to working by the pulsatory gas flow in accordance with the prototype, it is not revealed essential difference with the loss of the mass of the unprocessed models. In the models, subjected to working, by the pulsatory gas flow using the declared method as a result of a stay 4%- m the aqueous solution HCl with the duration 15 of twenty-four hours the loss of mass to 24% less than in

the unprocessed models, which can be explained by the creation of favorable for increasing corrosion resistance of the distribution of dislocations and other defects of crystalline structure under the action of the mechanical waves, caused by the pulsations of the air flow, which leak ins to the model, to what a reduced temperature of action also contributes. In this case in proportion to the propagation of corrosion into the deep layers, the difference in the loss of mass in the time in the processed and unprocessed or processed in accordance with the prototype models it did not become less, which indicates the volumetric nature of the effect of an increase in corrosion resistance reached.

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