

Nano-coating as a method to improve mechanic characteristics of materials

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The technology of high strength anti-corrosion nano-coating was developed by the Institute of High Current Electronics. The technology of nano-coating alters physical and mechanic characteristics of materials and significantly extends the operational time of objects and tools made from such materials.

This study examines both mechanic and acoustic characteristics of the aluminum alloy with the various depth of nano-coating. The Al alloy is widely used by the industry to produce blades for the aircraft, fastening joints and parts of constructions of medium strength.

The paper examines acoustic emission created during the deformation of alloy samples.

Additional distorting impulses are detected when localizing the signals of acoustic emissions in materials with nano-coating. However, these impulses do not influence the ordering of the signals of acoustic emissions until the moment of alloy's deformation. The distance between the maximums of localization remains unchanged.

The findings of the study show that the examined aluminum Al alloy with the nano-coating has increased resistance without decrease in its plasticity characteristics. The plasticity of alloy varies with the change of the nano-coating depth and the time of the nano-coating treatment. The best results in plasticity were achieved at the nano-coating treatment for one hour. The study concludes that the mechanic features of alloys widely used in the industry can be improved by the present nano-coating technology.