# СЕКЦИЯ 6
## НОВЫЕ МАТЕРИАЛЫ И ТЕХНОЛОГИИ В СЕЛЬХОЗМАШИНОСТРОЕНИИ

### NEW TECHNOLOGY OF STEEL PARTS WEAR- AND BENDING RESISTANCE INCREASE

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Improvements of protective and tribology properties of the machine part surfaces can be achieved both through creating a special topography of the surface layer, and applying special coatings thereto. The coatings, which are applied to the friction surfaces, can significantly improve reliability of machines and devices. On applying the coatings, there could be provided running-in ability of the friction surfaces, prevention of scuffing; lubrication at the initial time before oil supply to the friction surfaces, minimal wear of the friction surfaces, the lowest coefficient of friction and minimal changes of the same during operation, increasing contact friction fatigue of friction unit materials, and others.

There is known a sulphiding method that prevents seizing, and provides creating a film of sulfides on a part surface. The sulfides increase the surface activity of metals and alloys, as well as the process of wetting the surfaces with active agents, and they also increase seizing resistance. An iron sulfide (FeS) film increases wearing resistance of friction surfaces and improves running-in ability thereof. A ferro - sulfide coating has relatively high porosity and it absorbs a large amount of grease providing the material with the self-lubricating property.

Traditionally, a sulphiding method is a process of saturating a metal surface layer (of steel, cast iron, titanium alloys, etc.) with sulfur in appropriate salt baths. A depth of a sulphided layer is up to 50 microns. Besides increasing a surface roughness and dimensions of a part being processed, the disadvantages of the conventional sulphiding method includes the necessity to heat the entire part, and accordingly, the structural changes of metal, distortions and warpage, large processing time, high consumption of electricity, negative impact on the environment, and others. There is known a method wherein sulfur is introduced into the part surface by electric spark alloying (ESA), the same as electroerosion alloying (EEA). To introduce sulfur, it is deposited on a part surface as a powdered sulfur layer, and then there is carried out the process of alloying the part surface through the above said layer by the materials of the part or a coating. In the course of processing, applying of the sulfur powder is repeated 2-3 times. Thus, as a result of research aimed at improving the sulphiding process for the steel and iron cast substrates by the EEA method. In the course of the sulfur saturation (sulphiding) process of the surfaces of steel 20 and ductile cast iron by EEL method with the use of a special electrode-tool made of stainless steel 12H18N10T at the device of "Elitron -22A" model, with increasing discharge energy from 0.02 to 0.55 J, the sulphided layer depth increases from 10 to 75 microns, and the surface roughness Ra increases from 0.7-0.8 to 6.2-6.7 microns.