

out by applying high voltage to the control gate. This voltage must be sufficient to provide a breakdown between the control and floating gates, after which the charge from the control gate is transferred to the floating.

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### THEORY AND PRACTICE OF APPLICATION OF EPILAMIC COATINGS

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The efficiency of agricultural machinery depends mainly on its reliability – the ability to perform specified functions with minimal labor costs and material resources for a long time. The main indicator that determines the efficiency and resource of equipment is the intensity of wear of friction parts. By choosing the

right material and coating of triple couplings, you can significantly increase the wear resistance and durability of friction units during operation

A joint review of the molecular forces and deformation boundary layer led to the formulation of the concept of "third body" in contact. The boundary layer of the lubricating environment with adjacent films on solid contact surfaces is considered as one of the main factors of interaction [1]. The study of the structure and composition of the surface layers of solids allowed to obtain fundamental results that can be used to describe wear as a dynamic complex of processes of destruction of the original structures, the formation of new structures and their destruction. This gave impetus to the creation of the theory of frictional interaction based on the description of mass transfer processes during friction. It has been found that changes in the mode of friction or the properties of the surface layer significantly affect the amount of wear and friction force. Dependencies describing the process of dynamic interaction of bodies, in particular the process of boundary friction of metals, are revealed. Studies show that by purposefully changing the external conditions, composition and nature of the lubricant, you can change the properties of the friction surfaces in the desired direction [2].

This work is a composite study devoted to increasing the post-repair durability of friction units of gear pumps HIII - K. In previous works, the problem of increasing the efficiency of mobile agricultural machinery by applying anti-friction non-abrasive finishing in combination with the addition of additives to the lubricant, which ensure the efficiency and durability of friction parts in operation, was theoretically substantiated and solved. It is curious to use an epilams. The epilam modifies the treated surface without changing its structure, giving the surface antifriction, anti-adhesive, hydrophobic, protective and other useful properties. The formed barrier film can withstand temperatures up to 400° C, does not break at shock loads up to 300 kg/m<sup>2</sup> [3]. The mechanics of the interaction of surfactants with the surface of a solid body is as follows: during processing a layer of oriented molecules is formed on the surface, which radically changes the energy properties of the surface of the solid body. Molecules that are fixed by chemisorption forces forms Langmuir structures in the form of spirals with axes normally directed to the surface of the material.

Spiral molecules are able to capture electrons in those parts of the surface where the electron density is particularly high, and thus "land" on the surface. Places with high electron density are formed in those parts of the metal surface where there is a breach of the crystal lattice. Molecules of surfactants interact with these electrons, forming a common electronic structure, which causes a particularly high adhesion of the coating to the surface of the substrate.

Laboratory studies to obtain a functional relationship between the structural parameters of the technical condition of parts treated with epilam, and the functional parameters and operating time of the hydraulic pump, was carried out using stand КИ-4815М.

A detailed analysis of the results of research to improve the operational reliability of hydraulic pumps modification HIII–K through the use of epilam coatings of the working surfaces of the parts of the pumping units showed [4]: in the process of running-in the repaired gear pumps, in which the parts of the pumping units were treated with epilam, when running for fifty hours a stabilization of their supply is observed, which is explained by the formation on the surface of the details of a layer of oriented molecules that radically change the energy properties of the surface, giving the surface antifriction, anti-adhesive and protective properties, whereas for pumps, parts of which have not been treated with epilam, there is a decrease in pump supply and the period of its stabilization is absent during the entire period of running-in; a slight difference between the supply coefficients of the pumps for the first twenty hours of operation due to the general running-in of the parts and the formation of dimensional chains in the joints of the pumping unit by stabilizing the geometric position of the parts, which has the same consequences for pumps whose parts have been treated with epilam and for pumps whose parts have not been treated with epilam; the increase in the difference between the supply coefficients of the pumps after running twenty hours, stipulated by changes in resource parameters as a result of wear of the pumping unit parts, while repaired pumps, parts of the pumping units which are treated with epilam, at a runtime of sixty hours, the supply rate is 1,4–2,25 % higher than the supply rate of repaired pumps, parts of which was not treated with epilam. The results of the research confirm the effectiveness of the use of surfactants in order to increase the post-repair life of gear pumps.

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