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Innovative Method of Storage of Agricultural Machinery

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ABSTRACT

In the aggressive environment of agriculture in the decomposing-mechanical erosion of materials is observed the phenomenon of structural adaptation of the initial structures of the upper layers to a more energetically viable form of loading under these conditions.

Agricultural machinery operates in a changing external environment. That is, weather, humidity, heat, soil, salts, mineral and organic fertilizers, biological waste. All this has a negative impact on the main working parts of the machine over time. The most important of these effects is corrosion.

Corrosion occurs as a result of chemical influences and climatic conditions and can be divided into several types. Atmospheric degradation, subsurface degradation, dissolution of dissolved salts, biochemical degradation, local degradation, chemical degradation. The most corrosive elements of agricultural machinery are the mineral and organic fertilizers (salts that do not penetrate into the soil and are not absorbed by plants).

In the aggressive environment of agriculture, the phenomenon of structural adaptation of the initial structures of the upper layers to a more energetically viable form of the load is observed in the decomposing-mechanical erosion of materials.

KEYWORDS: *Agriculture, aggressive environment, material, erosion, mechanical erosion, stratification, loading, conditions.*

Introduction

Resolution of the President of the Republic of Uzbekistan Sh.M.Mirziyoev dated April 4, 2019 No PP-4268 "On additional measures for the timely provision of the agricultural sector with agricultural machinery" signed. According to him, in recent years, active measures have been taken to provide the agricultural sector of the country with modern domestic and foreign agricultural machinery that meets international standards and meets the natural climatic and soil conditions of the country's regions.

Despite the measures taken, more than 25% of the existing agricultural machinery has been in operation for more than 15 years, so providing agricultural producers with quality and affordable machinery remains a priority and requires further support from the state.

The President of the Republic of Uzbekistan on July 31, 2019, No. PP-4410 "On measures to accelerate the development of agricultural machinery, state support of the agricultural sector with agricultural machinery" The development of the agricultural machinery industry in the country, increasing the production and expanding the range of finished products for export, as well as Consistent measures are being taken to provide the population with locally produced equipment.

At the same time, the system of cooperation between local manufacturers of agricultural machinery is not established, the share of imported parts in the production of machinery is high, and there is no stable system of supply of machinery to the agricultural sector. Incomplete regulation of production and incompatibility of production with science require special attention in this area.

As a result of technical progress, new complex techniques are being developed and further improved. Therefore, a strong base of service, repair and quality maintenance is necessary for the effective use of equipment. It is known that the long-term use of existing equipment in the district machine-tractor parks, agricultural clusters, MMTP and farms, their maintenance and repair, as well as their proper storage. Directly related. Existing equipment can be used effectively only if the above requirements are met. After the use of agricultural machinery, the correct implementation of maintenance work, including maintenance and repair, will ensure that they do not lose their serviceability for the coming years. Provides

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In the aggressive environment of agriculture in the decomposing-mechanical erosion of materials is observed the phenomenon of structural adaptation of the initial structures of the upper layers to a more energetically viable form given the loads.

Reconstruction of the structure is carried out by radically changing the mechanical and physicochemical properties of the upper layers to a thin film that is higher and stronger than the physicochemical effects of the upper layers. The internal mechanism of structural adaptation reflects the processes of structural-thermal activation and physicochemical attenuation of the material of the upper layers. The kinetics of structural adaptation consists of shifts of rhythms of activation and deceleration (periodic formation and decomposition of secondary layers).

The phenomenon of structural adaptation of materials in friction is connected with the passage of a whole complex of inevitable thermodynamic processes and cannot be carried out in a coherent manner with the help of any of the several interconnected processes and events. The laws of the phenomenon of structural adaptation include dynamic equilibrium, and the self-regulation of processes in the normal state of friction and in the normative friction and energy ratio associated with specific work.

The phenomenon of dynamic proportionality of the processes of formation and decomposition of secondary structural coatings is determined by measuring the electrode potential of the eating surfaces. the physico-mechanical meaning of the phenomenon of adaptation in erosive-mechanical erosion is revealed by studying the effects of external mechanical effects on friction and wear, the nature of the material being eaten, the composition of the environment.

Several studies have been conducted on the method of studying the corrosive-mechanical erosion of metals. The corrosion resistance of metals is determined not only by their physicochemical properties, but also mainly by the properties of the secondary structural films formed on the surface. According to IV Vasilev, the rate of corrosion of metals can be estimated by electrochemical processes in electrolyte solutions - the size of the electrode potential.

B.B.Kruman and V.A.Krupitsina show the effect of various mechanical factors (friction path, shear rate, pressure in the contact area, hardness of materials) on the rate of corrosion in a solution of neutral salts in neutral salts, the parameters that determine the rate of decomposition (oxygen in solution, temperature, the concentration of the solution). B.I. Kostetsky to control the processes of friction and corrosion; the level of physical and chemical activity of the surface during friction under loads under different conditions; considers it necessary to determine the dynamic balance of fracture and recovery of secondary structures of friction.

To evaluate these dimensions, the electron microscope method, the electrochemical potential during friction, and the electromagnetic characteristics of the surface layers are recommended. The methods presented in the study do not provide for the separate study of various factors and their interaction in the erosion-mechanical erosion, but in the work use complex and complex methods of research, the use of electrochemical processes to regulate the change and decay of friction surfaces. paths are not shown.

In a number of cases, the authors have different views on the influence of certain factors on the description of the kinematics of corrosion and electrochemical processes in the deformation of materials. That is, an increase in the stress at the limit of elastic deformation in the metal at work leads to a linear change in its electrochemical potential in the electrolyte. According to E.M. Gutman, flexible deformation does not affect the chemical activity of the metal, while plastic can accelerate its interaction with the environment several times. The inconsistency of the data obtained can be explained by the complexity of the complex of simultaneous electrochemical, chemical and physical processes of the friction parts in the communication area, the diversity of working conditions of bending pairs and, perhaps, differences in research methods.

Decomposition-mechanical erosion in a chemically active environment is determined by the rate of decomposition of the resulting oxide films. in a chemically inert or weakly active medium with sufficiently strong abrasive properties, the metal is exposed directly to the metal, not to the oxidized films by mechanical action. In addition, the type of food depends not only on the environment, but also on the properties of the material being eaten.

For example, stainless steels have a high resistance to corrosion, so the role of mechanical factors in their corrosion, rather than oxide films, and the metal itself is even stronger in a chemical environment.

Methods.

The presence of erosive-mechanical erosion is determined using physical methods of research of the eroded surface. These methods require a lot of work, complex, expensive equipment, specially trained workers. There is no method at all to determine the role of the destructive factor in degradation-mechanical erosion.

We have developed a method for determining the wear and tear of mechanical wear based on a comparison of the wear rates in continuous friction and friction with stops, and the role of the wear factor.

The strength of the stops allows oxidized coatings to form and break down many times over the base metal. The greater the difference in the rate of erosion, the greater it is determined by the erosion processes occurring on the friction surface. In the absence of abrasive-mechanical wear, the wear rate is the same in the case of continuous and continuous friction, because no oxide coating is formed here, only the base metal is eaten.

Results.

Thus, the formation of an oxide coating during friction with stops may be more or less strong than that of the parent metal. If the coating is formed during stagnation, then the conditions for their formation during friction are improved due to the reduced possibility of activation.

We have studied 45 studies of steel: a) pure decay; b) continuous friction with limited environmental degradation conditions; c) the interaction of steel with the environment in the case of friction with the stops, which allows the coating to form and break down many times (Table1).

Table 1 with non-stop friction comparative data on weight loss

Environment	Weight loss, g / (m2.s.)			
	In the fall	In constant friction	Total	Stopping and rubbing
Potassium chloride	0,07	0,80	0,87	1,14
Ammonium nitrate	0,12	5,35	5,47	8,19
Ammonium sulfate	0,21	3,45	3,66	6,74
Quartz sand	-	6,22	6,22	6,39

Note: Study mode at stop friction: 1 min-stop; 1 min-friction.

As can be seen from the table, the greatest weight loss in an aggressive environment is the same in friction with stops, and in friction with non-corrosive quartz sand, the weight loss is the same with friction with stops and without friction.

The corrosive activity of this medium in the friction of this material was determined using the following dimensionless quantities:

$$K_u = \frac{i_n - i_H}{i_H}$$

Where: i_n, i_H, is the wear rate at stopping and non-stop friction.

The closer the value of Ki is to zero, the less the role of the erosive factor in mechanical erosion.

Eating at Ki = 0 is determined only by the mechanical factor. If Ki <0, this means that the friction will form an oxide film that is more resistant to friction than the base metal.

The study of mechanical erosion of steel was carried out on a "wing" type device. Friction can be stopped in two ways: manually and automatically. The automatic mode is carried out by means of the command KEP-12U electro pneumatic device and VS-10 time relay, the combined operation of which allows changing the duration of friction and stopping time from 30s to 18 hours at any interval of 30 s during this time.

Discussions.

B. B.Kruman and V. A. Krupitsina show the effect of various mechanical factors (friction path, shear rate, pressure in the contact area, hardness of materials) on the rate of corrosion in a solution of neutral salts in neutral salts, the parameters that determine the rate of decomposition (oxygen in solution, temperature, the concentration of the solution).

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Conclusions.

As a result of the research, the study of mechanical erosion of steel was carried out on a "wing" type device. Friction can be stopped in two ways: manually and automatically. The automatic mode is carried out by means of the command KEP-12U electropneumatic device and VS-10 time relay, the combined operation of which allows changing the duration of friction and stopping time from 30s to 18 hours at any interval of 30 s during this time. Techniques used in aggressive environments will result in weight loss due to friction of the working parts under the influence of mineral and organic fertilizers.

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