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PROVIDING DIRECT QUALITY FORMATION AND TECHNICAL PUMP LEVEL IN DESIGN AND MANUFACTURING

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At the current stage of development of economic and social relations in Ukraine and Jordan one of the main tasks is integration into European and world structures, cooperation with the World Trade Organization. It is impossible to solve all these issues without providing the appropriate quality and technical level of all products of the enterprises of the machine-building complex.

High-pressure processes in the oil and gas industry require special solutions of pump technology when sensitive fluids are to be pumped. These can be aggressive, abrasive, hot, cold, explosive, toxic or corrosive fluids.

Recently, many theoretical and practical issues regarding the quality of pumping equipment, technical level and technology have been solved. However, it is clear that a radical solution to the quality problem can only be made on a clear scientific basis, which involves the creation of a system of means and methods to achieve the necessary levels of quality at all levels of the life cycle of pumping equipment. Such an approach can provide optimality in solving both the problem as a whole, and its components.

Today, in the design and technological preparation of production, selection, designation and maintenance of the system of quality parameters parameters are carried out with insufficient scientific justification. The lack of a scientific approach to the appointment of the parameters of the surfaces of the components usually leads to unnecessary increased requirements for products made without significant increase in its reliability. It is therefore necessary to predict the quality parameters of material processing, and this should be considered a complex effect cutting mode settings and other factors.

The development of methods for calculating the accuracy of machine parts is one of the main areas for improving the technological process, improving quality, increasing productivity and reducing the cost of machines and appliances. That is why the task of determining the distribution laws and the probability characteristics of the sizes and shape for the surfaces of parts is of considerable interest. The solution to this problem will provide an opportunity to obtain more complete data on the resulting accuracy of parts processing, which are essential for ensuring the high quality, reliability and durability of the pumps.

The main task of the work, which has been carried out jointly by scientists from Jordan and Ukraine in recent years, is to create normative documentation

for ensuring the quality and performance of the basic parts of the pumping equipment under serial production conditions, taking into account its specific features in comparison with other stages of the life cycle of the basic parts of the pumping equipment .

It is known that quality can be presented as a set of indicators. In this case, the main ones should be considered those indicators, which are at the required level, a decisive influence on the properties of the details. Thus, the reliability of the work of high-rotating parts of pumps, such as rollers rotating on sliding bearings, is directly related to the deformations of the shape of the cross-section of the crankshafts. The movement of the shaft will be reliable (in terms of uniformity of motion, position of the axis), if the deviation from cylindrical and roundedness will be within the specified limits. Since these parameters have a decisive influence on the quality (reliability) of the entire site, their inherited nature should be considered and the process of the technological process at which the specified deviation originates is detected. It is also necessary to consider the evolution of this deviation in order to prevent its development. However, in the same shaft, in another case, the parameter may be the main factor associated with the stresses of the surface layers. Then the technological process of inheritance of stresses is considered.

As a result of the work a method has been developed that allows to evaluate the parameters of the quality of material processing using the method of inverse deterministic factor analysis, where the input data is the stability of the tool, the intensity of cutting and the limit of endurance. The theoretically proved and experimentally confirmed the possibility of appointment of optimal cutting modes in order to provide the necessary values for quality indices and expediency of using similar methods for providing calculations of the quality indices of the surface layer after the processing of materials by cutting.

The obtained results of simulation of real surfaces can be used for an informed decision of the problems of control and control of the accuracy of the size and shape in the transverse and longitudinal sections of the pump parts.

The use of the proposed ideas in modern high-pressure plunger pumps allows the transport of liquids of the most diverse type with very high efficiency. The modular design of the design in combination with a wide range of materials will allow the manufacture of pumps for special applications at realistic prices, without requiring minimal volumes. The use of special materials, including nickel alloys for contact with water, is up to date for us.

In addition, we have special competence in the pressure testing of pipes, pressure vessels and pipelines: With our engineering know-how we build systems to match exactly to the test case. An example is a virtual 9-cylinder pump patented by us for pipeline stress tests.

Implementation of the research results and development of the proposed technologies is currently taking place in several companies in Jordan and at Sumy Plant of Pump and Power Engineering, Sumy, Ukraine.