OPTIMIZATION OF THE TECHNOLOGICAL PROCESS OF PREPARATION OF LONG SHAFTS

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In mechanical engineering, there are many technological processes for the preparation of long shafts. It is necessary to solve the problem of choosing the optimal option from many such technological processes. An optimal option of a technological process is understood as an option that fully meets all requirements from this detailed drawing, predicts high efficiency and indicators based on existing production conditions. In automated design, it is increasingly important to take into account as much variability as possible, since factors such as the experience and intuition of the technologist are automatically negated when the process is carried out with the help of EHM. EHM analyzes many options and indicators of the technological process. Therefore, the approach to optimization is the main direction of improving automated design methods.

A technological process is considered optimal, if the requirements reflecting the cutting conditions of the technological process are met from the first, and the extremum (maximum and minimum) of the criterion of optimality is estimated from the second.

The following are often used as criteria of validity:

- maximum stability of the cutting tool;
- minimum grain time;
- the maximum of production (process, operation).

Recently, the integral criteria, which take into account all the expenses spent on the organization of the technological process, are being taken into account as a criterion of efficiency. These criteria are essentially economic. Among the criteria included in this group, the simplest one is the technological value. This criterion takes into account the sum of effects resulting from the price of the body, which negate each other in most factors. Actions with complete criteria against others can be expressed as follows;

$$X = T_D \cdot N + M_{mk} \cdot K$$

where Td is the full price of a product (retail) unit; Annual production volume of N-product (detail); M_{mk}- coefficient of application of ka'ital castings; K-kaital casts (initial movements).

The full cost of a detail (product) can be expressed as follows:

$$\boldsymbol{T_D = T_r + T_m}$$

here, $T_г$- cost depending on processing mode; $T_м$- movements depending on the capacity of the detail material.

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The issue of technological process optimization involves the following three elements:

1) Mathematical model of the process;

2) Objective function (optimality criterion)

3) Optimization method (optimization algorithm). To solve the problem of optimization, it is necessary to describe its constituent parts in the form of a mathematical expression. The optimization criterion is expressed as a function of the optimization parameters and other indicators of the process. This function is often called the objective function.

The parameters to be optimized are the parameters of the process, the optimal values of which are determined during the solution of the problem. Constraints can also be expressed in the form of a function of parameters to be optimized, and they are often in the form of an inequality.

- on the productivity of the technological process;
- according to the quality of the product (compliance with the accuracy of shape and size, microgeometry of the surface, physical and mechanical properties, etc.);
- on the technological capabilities of equipment, tools and devices;
- on organizational and technical capabilities of production.

So, the optimization of the technological process is, first of all, the formation of the optimal set of technological factors, the number and types of iterations, and then the determination of the optimal value of each technological factor.

References:

1. Xaydarov A.Q. Mashinasozlik texnologiyasi asoslari. Toshkent. Fan va texnologiyalar. 2019 y.

2. Анцев А.А. и др. Оптимизация режимов резания с учетом уровня выбрации на основе оременения методов искуственного интеллекта. Вестиник Воронежского государственного университета. Т. 16. 2020 г.

3. Karimov, B. Y., & Ergashev, I. K. (2022, March). IMPROVING THE OPERATIONAL RELIABILITY AND DURABILITY OF ROTATIONAL PARTS BY ULTRASONIC TREATMENT. In Conference Zone (pp. 4-6).

4. Karimov, B. Y., Muxsiddinov, J. R., & Ergashev, I. X. (2022). PROSPECTS FOR STUDYING 3D MODELLING PROGRAMS IN MECHANICAL ENGINEERING. *ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 7.603*, *11*(06), 64-67.

5. Karimov, B. Y., Muxsiddinov, J. R., & Ergashev, I. X. (2022). PROSPECTS FOR STUDYING 3D MODELLING PROGRAMS IN MECHANICAL ENGINEERING. *ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 7.603*, *11*(06), 64-67.

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