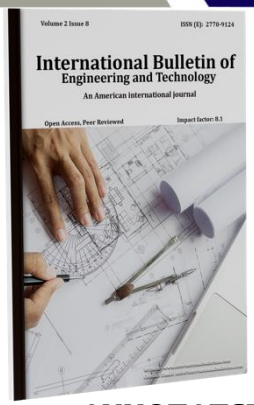

SELECTION OF EQUIPMENT AND TECHNOLOGICAL EQUIPMENT

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ANNOTATSIYA: Texnologik uskuna, jihoz, kesish va o'lchash asboblarini tanlash amaliy ko'nikmalarini egallash masalalari ko'rilgan. Mahsulotni ishlab chiqarish hajmiga qarab spesializatsiya darajasi va yuqori unumdorligi bo'yicha dastgohlar, shuningdek raqamli dasturiy boshqaruviga (RDB) ega bo'lgan dastgohlar ham tanlanadi.

KALIT SO'ZLAR: mexanik ishlov berish, texnologik jarayon, detalni tayyorlash unumdorligi, Mahsulot ishlab chiqarilishi, texnik-iqtisodiy taqqoslanish, Dastgoh uskunasini tanlash, dastgohning detal o'lchamlari.

АННОТАЦИЯ: Рассмотрены вопросы приобретения практических навыков по выбору технологического оборудования, инструмента, режущего и измерительного инструмента. В зависимости от объемов производства продукции выбираются станки с высоким уровнем специализации и высокой производительностью, а также станки с числовым программным управлением (ЧПУ).

КЛЮЧЕВЫЕ СЛОВА: механическая обработка, технологический процесс, эффективность подготовки деталей, производство продукции, технико-экономическое сравнение, выбор станочного оборудования, размеры деталей станков.

ANNOTATION: The issues of acquiring practical skills in the selection of technological equipment, tools, cutting and measuring tools were considered. Depending on the volume of production, machines with a high level of specialization and high productivity, as well as machines with numerical control (NCC), are selected.

KEY WORDS: mechanical processing, technological process, part preparation efficiency, product production, technical and economic comparison, selection of machine tool equipment, machine tool part dimensions.

RESULTS:

The choice of machine tool equipment is one of the most important tasks in the development of a technological process for mechanical processing of workpieces.The efficiency of part preparation, economical use of production areas, mechanization and automation of manual labor, electricity, and ultimately the cost of the product depend on its correct selection.

Depending on the volume of product production, machine tools with a degree of specialization and high productivity are selected, as well as machines with numerical program control (NCC).

The choice of each type of machine tool should be economically justified. A technical and economic comparison of the processing of this operation on different machines is carried out. It is necessary to accept the type of machine tool that provides the minimum labor and material costs for the specified volume of product production, as well as the cost of processing the workpiece. The selection should include a brief description of the machine tool model

used in the technological process, and indicate the advantages of the selected machine tool model over other similar models.

When describing the selected machine model, it is possible to limit ourselves to a brief technical description. If the selected machines are special, aggregate or specialized, then their basic schemes should be described.

When choosing machine tool equipment, the following should be taken into account:

production features;

ensuring the specified accuracy in processing; the required shift (or hourly) productivity; compliance of the machine tool with the dimensions of the parts;

machine power;

ease of operation and maintenance of the machine tool;

overall dimensions and cost of the machine tool; the possibility of equipping the machine tool with high-performance devices and means of automation and mechanization;

kinematic characteristics of the machine tool (transmission range, spindle rotation frequency, etc.).When choosing machine tool equipment, it is also necessary to take into account modern achievements of domestic machine tool building. Information about the selected machine tool equipment should be entered into a table, which should indicate the machine tool model, the largest overall dimensions of the workpiece being processed and the overall dimensions of the machine tool for each technological operation, the economic accuracy of processing and the roughness of the processed surfaces, as well as the power of the machine tool (Table 1).

Table 1

Technological classifications of equipment used

Operation	Workshop model	Limit and maximum dimensions, mm						Economic accuracy of processing (quality)	Economic roughness of surface treatment Ra, μm	Workshop capacity,kVt
		Preparations			Workshop					
		Diameter (width)	Length	Height	Width	Length	Height			

This information is taken from technical classifications of machines, information tables, and machine passports.

DISCUSSION:

Selection of fixtures. When developing a technological process for mechanical processing of blanks, it is necessary to correctly select the fixtures, therefore, these fixtures should allow to increase productivity, complete the initial marking of the blanks and check them when installing them on the machine.

The use of machine fixtures and auxiliary tools in the processing of blanks provides a number of advantages:

increases the quality and accuracy of processing parts;

- reduces the scope of work due to a sharp reduction in the time spent on installation, checking and fastening when processing blanks;

- expands the technological capabilities of the machines**;** allows you to simultaneously process several workpieces fixed in one fixture.

The choice of machine tool equipment should be based on an analysis of the costs of performing the technological process for a given number of workpieces in a given time interval. The rules for selecting technological equipment (GOST 14.305-78) provide for six systems of technological equipment, which, depending on the type of production, are designed to perform various types of work.

The following are included in the technological equipment systems:

- non-separable special equipment systems (NSO);
- universal-adjustable equipment systems (UNO);
- universal-assembled equipment systems (USO); assembly-disassembly equipment systems (SRO);
- universal-non-adjustable equipment systems (UBO);
- specialized adjustable equipment systems (SNO).

Cutting tool selection. When developing a technological process for machining a workpiece, the choice of a cutting tool, its type, design and dimensions is largely predetermined by the processing methods, the properties of the material being processed, the required accuracy of processing and the quality of the processed surface of the workpiece.

When choosing a cutting tool, one should strive to adopt a standard tool, but, when appropriate, use special, combined, finishing tools that allow for the simultaneous processing of several surfaces.

The correct selection of the cutting part of the tool is of great importance for increasing productivity and reducing the cost of processing. For machining steel, it is recommended to use tools with a cutting part made of titanium-tungsten hard alloys (T5K10, T14K8, T15K6, T15K6T, T30K4), high-speed tool steel (R18, P6M5, R9, R9F4, R14F4), tungsten hard alloys. For machining cast iron, non-ferrous metals and non-metallic materials, tools made of tungsten hard alloys are used. The choice of material for the cutting tool depends on the shape and size of the tool, the material of the workpiece being machined, cutting modes and type of production. The cutting tool should be selected based on the methods of machining the parts from the relevant standards and informative literature, as well as tools from the leading metalworking company Sandvik Coromant and other foreign companies.

If the technological characteristics of the part do not limit the use of high cutting speeds, then it is necessary to use high-performance designs of cutting tools equipped with hard alloys, since, as application practice shows, the use of this type of cutting tools is economically more profitable than the use of tools made of high-speed steel. This especially applies to cutters (except for finishing, small-width, automatic), milling cutters, countersinks, the design of which is equipped with hard alloys and is well-machined.

In the practical training report, it is necessary to analyze the cutting tool selected in the operation for the transitions.

When choosing a cutting tool, it is necessary to use data on the work [8]. Recommendations for choosing an abrasive tool are given in GOST 3647-71 and technical literature.

CONCLUSION:

Selection of control methods. The control method allows to increase the productivity of the controller and the machine operator, to create conditions for improving the quality of the manufactured product and to reduce its cost.In individual and serial production, a universal measuring instrument is usually used (a caliper, a depth gauge, a micrometer, a protractor, an indicator, etc.).[3].In mass and large-scale production, it is recommended to use limit gauges (gauges, plugs, templates, etc.) and active control methods that are widespread in many mechanical engineering industries [3].In the report, the student must explain the control method used and give a classification of the measuring instrument or control device for this technological operation. All information about the selected machine tool and technological equipment is collected in the final table.

Procedure for performing the practical exercise

1. Familiarize yourself with the procedure for selecting technological equipment and TS (organizational standards).

2. Prepare a table of technological classifications of machines.

3. Fill in the table of equipment used in the procedure for performing technological operations.

4. Compile a TS selection table.

5. Fill in the table of technological equipment selection.

6. Prepare a report.

Report content

1. Title and purpose of the practical training.

2. Brief information on the selection of machine tools and TS.

3. Table with technical classifications of the equipment, cutting tools, equipment and control tools used..

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