

METHODOLOGY OF TEACHING THE WORKING PRINCIPLE OF MODERN LOOK METAL WORKING MACHINES

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Abstract: *Information about modern metalworking machines and the organization of multimedia lessons on how to operate these machines in technology classes taught in secondary schools, as a result of which students learn metalworking and the formation of the ability to use them in life is discussed.*

Key words: *metalworking, cutting, drilling, pressure, metal, pressure, preparation, planing.*

The basis of the modern education system is a high-quality and high-tech environment. Its creation and development is technically complex, but such an environment serves to improve the educational system, to introduce innovative information and communication technologies in the educational process, and to develop science and technology.

Metals can be cut, sheared, bent, bent and turned. According to the type of metal processing, the equipment used is divided into the following types.

- 1-metal cutting tools include shears and saws, chisels, milling cutters, chisels, etc.
2. When bending metals, hand tools from the bolo and omur group and machines from the press group are used.
3. During the cutting and assembly of metals, tools such as a trowel and a drill are used.
4. In the processing of metals, processing tools of various sizes are used.
5. Various abrasive tools are used to shape metals.

Metalworking - a set of works performed in heat (thermal), mechanical, chemical processing of metals and alloys.

Heat treatment of metals — actions used to change the properties (internal structure) of metals and alloys: softening, tempering, normalizing, releasing, improving, tempering, chemical-thermal treatment, passivation.

Annealing means heating metals to a certain temperature, holding them at this temperature for a certain time, and then cooling them slowly, sometimes together with the

furnace; in which the properties of metals change. As a result, the malleability and plasticity of metals increases, magnetism and other properties improve.

Forging - heating metals to a certain temperature and cooling them quickly; in this, non-uniform structural states of metals are strengthened, properties of metals change differently.

Normalizing - heating low (up to 0.3%) and medium (0.3-0.6%) carbon steel to approximately 800-950° and cooling in air; in this case, the large grains in the steel are reduced, the strength, plasticity and viscosity of the steel increase.

Improvement is a type of thermal operation; It consists of heating and cooling at a temperature of 550-650°. It is used for machine parts working under dynamic load.

Tempering - changing the structure and properties of metals and alloys by keeping them at room temperature for a long time (natural tempering) or heating them (artificial tempering). Improving hardness, strength, magnetic and other properties.

Chemical thermal treatment of metals — heating of metals in a chemically active gas, solid or liquid environment at a high temperature and slightly cooling at this temperature. In this case, the chemical composition, structure and properties of the surface layers of metal objects change. This includes nitriding, chrome plating, metallization, etc.

Mechanical processing of metals - giving different shapes and sizes to details by scraping. It is performed on metal cutting tools (chisel, drill, countersink, reamer, milling machine, etc.) and metal cutting machines (lathes, grinding machines, planing machines, etc.).



Figure 1. Machines for decorative processing of metals.

The machinability of metals is reflected in the general rules of the process, which represent the formation of slag, the formation of a new surface, and the quality of the processed surfaces. All structural metals are conditionally divided into 4 groups according to their relative workability:

- 1) easy to work (brass, bronze, deformable alloys of aluminum, soft cast iron);
- 2) medium cutting workability (carbon and low-alloy structural steels, silumins, cast irons of medium hardness);
- 3) medium to lower workability (steels belonging to high-alloyed martensite, martensite-ferrite, austenite-martensite class, hard cast iron);
- 4) difficult to work (high-alloy construction steels of the austenite class, heat-resistant and acid-resistant special nickel-ferrite and nickel alloys, difficult-to-melt alloys).

The indicators representing the mechanical properties, in particular, the resistance of the metal to the cutting tool increases with the increase of hardness and strength limits. For this reason, these indicators are parameters representing the cutting mode.

The following are the minimum skills and qualifications that students should know in metalworking technology:

- to have basic knowledge about the importance of engineering and technology in the national economy, the classification of machines according to their tasks in production, construction materials (metals, wood, plastics);
- about the processing technology of these materials, new technologies that have fundamentally changed industrial production;
- general principles of construction and technical artistic design of new products and redesign based on design requirements;
- labor legislation and safety, sanitation and hygiene rules;
- mechanical processing of wood and metal with the help of drawings, sketches and technological maps, selection of equipment and tools necessary for work, etc. That is why certain hours are allocated for teaching and training students in basic schools about this metal and its processing technology.

The fact that the president and the government have set specific tasks for the education system, which is not just to monitor the state of education, but also to provide information about the state of the education system, help to improve the quality of education and make it more competitive. We made sure that it was explained to everyone that this is the direction to take.

In conclusion, we can say that today, as a result of developments in the education system, all young people are achieving high results. We think that it is necessary to achieve greater success through the opportunities given to young people. Education helps to solve the important problems of the construction of the society, to create the material and technical base of the society, to form social relations, and to educate a new person.

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