

PROCESSING METHODS WITH APPLICATION OF AN ELECTRIC FIELD AT LOW WASTE SEPARATION OF MATERIALS

Electrochemical method was originally developed for the grinding tools made of tungsten carbide[1]. The new process has shown clear advantages compared to expensive conventional grinding. The progress made at the present time, allow economical use of electrolytic method for machining of hardened steel. The use of abrasive wheels at a coal bundle will also contribute to the further development of the electrolytic polishing.

In the development of intractable materials designed electrochemical method should be compared with the spark erosion. Where you can use tools and a large area required to bring them current, electrochemical spark much more productive work. But if for some reason you can only use tools with a small footprint, the treatment will be the spark may be more economical, as the cost of the equipment for it is only about half the cost of equipment for the electrochemical treatment. Design tool to spark processing easier, but in electrochemical machining, the tool does not wear out. Furthermore, the electrochemical treatment does not damage the work surface provides a high purity grade and, in addition, the highest surface quality is obtained when the current density, and hence, the local metal removal rate maximum. This means that the highest surface quality is obtained when the processing is done at the maximum feed rate.

Combination treatments are aimed at intensification of the process of anodic dissolution. [2] Metal removal rate and precision formation in electrochemical processing depends on how fast the reaction is going transition of the workpiece material in the sludge. The rate of anodic dissolution limited by the presence of the film, passivating the surface and thickness of the diffusion layer.

When electric polishers allowance is removed or anodic dissolution of the metal and the pickup abrasive grain or just dissolved. In the first case, the tool contains a linked or free abrasive powder in the second - as a tool to use wooden or plastic blocks, located between the metal electrode-tool.

Areas of application processes with an electric field.

Comparing the technological characteristics of different ways, we can determine the most efficient possible use in engineering.

Electrical discharge machining in the electro-mode occurs at a relatively low energy pulses. Volume of metal removed during each pulse is small, and the depth of the wells is negligible. This allows you to take a surface with high precision and low surface roughness at low performance. In addition, the process is very power-hungry.

When using electrochemical treatment must meet the following requirements are common to all types of procurement and processing circuits.

1. Surface before electrochemical treatment must be free of scale and other non-conductive materials.

2. In places where the metal removal plan to do with the use of electrochemical treatment is not allowed local cleaning surfaces such as hard to control.

3. electrochemical treatment should be carried out after the heat treatment of workpieces. This avoids inaccurate due to distortion during heat treatment, prevents layer in the finished part.

4. When designing pieces allowance shall not be less than a certain limit, determined according to the possible dissolution in treated and adjacent surfaces, where the metal can be dissolved by the currents of the scattering and rapid removal at the edges of the details.

5. In the process does not involve surgery, and transitions to remove burrs and rounded edges on the surfaces after electrochemical.

After studying drawing blanks, parts, technical design features of electrochemical treatment process:

1. Choose a scheme of electrochemical treatment, given the shape of the workpiece, depending on the availability of equipment and tools.

2. Evaluate the manufacturability of the details and make the necessary changes to the drawings, applying electrochemical treatment.

3. Evaluate the technological characteristics of electrochemical processing and compare them with those of machining.

4. The expediency of the use of electrochemical treatment. If the item can not be made in another way, such a study is not required.

Series production of electrochemical treatment are useful in the processing of complex-shaped piece of high-strength alloys and materials with brittle, viscosity (superalloys, titanium and other alloys). Details of the construction materials are manufactured using an electrochemical process, if not easily accessible tool to the cutting area, or other ways to cause deformation, such as processing tubes and non-circular holes, a length to diameter ratio greater than 10.

Keep in mind also that the process of electrochemical machining can be easily automated and can be used to produce parts of the toxic, flammable materials, such as beryllium, magnesium.

The exception of the subsequent operations on processing of places of division of details allows to accelerate several times processing process, considerably to increase accuracy and quality of details, to lower an expense of scarce materials.

The list of the used sources

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