

Formation of Skills in the Production of Samples of Polymer Materials in the Teaching of Internal Combustion Engine Science in Students

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ABSTRACT

The article explains to students the advantages of the injection molding method in the manufacture of experimental samples of composite polymer materials, how to familiarize them with the process and its stages and form their practical skills.

In order to radically revise the content of the training of personnel in accordance with the priorities for the socio-economic development of our country, to create the necessary conditions for the training of specialists with higher education at the level of international standards, the decision of the president of the Republic of Uzbekistan dated April 20, 2017 "on measures to further [1].

The means of organizing the process of professional training of future engineers are associated with all components of the activities of students and teachers. They depend on the purpose set, the methods and forms of organizing the process they represent, and have a significant impact on the development of the individual. It is for this reason that factors of life activity that have a long-term character as tools for the evolution of professional training are considered effective. Setting medium-term goals associated with solving tasks that are considered relevant for a certain level of professional training evolutionism allows you to clarify the set of tools that ensure the optimality of the process of improving professional training [3].

In the conclusions given on the basis of the results of the analysis on the comprehensive study of the educational system of the Republic of Uzbekistan, as a result of the lack of ensuring the integrity of theory and practice in the process of Higher Education, the effective organization of conducting student qualification practices at production enterprises, the majority of graduates are studying their profession,, disadvantages have been noted, such as that the quality control mechanism of Education does not meet modern requirements. This in turn leads to a decrease in its scientific potential.

The decree of the president of the Republic of Uzbekistan dated July 27, 2017 “on measures to further expand the participation of sectors and sectors of the economy in improving the quality of training of higher education specialists” dated July 31 2017 was prepared on the basis of the analysis of national experience and world-wide achievements in the educational system and had the skills, it is aimed at the formation of a new generation of personnel capable of advancing and solving the tasks of perspective [2].

Great attention was paid to the use of modern equipment in providing quality education to students. This is of great importance in the students' formation of skills from processes in production.

Pressure casting is the most common method in obtaining car details, in which liquid plastic is poured into a metal mold under pressure, evenly distributed over it and hardened. The process of casting under pressure requires complex equipment and serious technical training. With this technology, any plastic products are obtained without additional processing.

The method of casting details under pressure has a high working performance, which has the following advantages [4]:

1. High accuracy of the finished product. Pouring (sending) liquid plastic under pressure allows it to be evenly distributed in shape, filling even the smallest holes.
2. The possibility of obtaining parts of any complexity, including with very thin walls. For the manufacture of products, a metal mold is made, the structure takes into account all the small details of the future product. The result is a simple and very complex product, which can be obtained with many holes and folds.
3. The need for mechanical processing of the product is minimal. Most often, the finished product does not require any processing. In the manufacture of complex products, too, the costs are very small.
4. Unlimited finished products. The metal mold created before production will last a very long time, with the help of which you can prepare any number of products;
5. Low cost-provided that a large batch is produced. The more items are made, the cheaper the price of a single copy. Because the main budget is spent on the stage of preparatory work, which is carried out only once.

The process of manufacturing plastic products by the method of pressure injection involves several stages. They can be divided into two groups:

- ✓ preparation works;
- ✓ direct casting.

Preparatory work.

1. Creating a 3D model of the product. A 3D model can be created using drawings, descriptions or photographs. Three-dimensional modeling is carried out by an experienced specialist in a special program.
2. Prototype preparation. After the 3D model is created and approved, it is possible to create a prototype, that is, the naamuna of the future product. This is often done using a 3D printing device. A prototype is needed to evaluate and test the future product. If any ambiguity is detected, the first step is returned and the 3D model is completed.
3. Design the mold. This process is carried out on the basis of a 3D model of the future product. When designing, it is important to take into account all the smallest detail and subtleties of detail.

4. Preparing the mold. The finished 3D model is divided into several parts. Each part is prepared separately, after which they are assembled into a mold.
5. Test. Then, using the finished mold, the first copy of the product is prepared, which is carefully studied and tested. If inaccuracies or defects are found, the mold is cleaned.

Preparatory work can take from several weeks to several months. However, this is an important stage that should not be rushed. The quality of future products depends on this.

At present, the creation of a 3D model of the product, the preparation of the prototype and the design of the mold were made possible in the innovative scientific research laboratory "Engineering and design", which was established at the Department of "automotive industry" of the Andijan Institute of Mechanical Engineering.

Direct casting.

1. Pouring plastic into a mold under pressure. Diluted plastic is poured into a mold under high pressure.
2. Evenly distribute the plastic into the mold. Due to the pressure, the plastic is evenly distributed throughout the shape, filling even small holes.
3. Cooling the mold and hardening the plastic detail. The cooling time depends on several parameters: the type of plastic, The Shape of the mold, etc. For small things, usually a few seconds are enough.
4. Finished product. After the mold has cooled, it opens to give the finished product [4].

For the direct casting process, a casting (thermoplastic automatic) appliance will be needed. The pressure casting device is shown in Figure 1. The pressurized casting machine consists of shtok (1), Porcelain(2), cylinder(3), soplo(4) and pressform(5).

A plastic composition of (1) 600-650 g is placed in the injection bunker of the foundry. The plastic composition is given to the material cylinder (3) of the foundry and heated in it for 30-40 minutes to a discharge of 240-270 0C. The detail heated to 240 0C harorat (4) is initially set to a shaping Board (5) heated to 80-100 0C.

When the piston of the foundry (7) is moved from right to left, the diluted plastic composition (6) is squeezed out of the cylinder by the tip, and it fills the groove between the forming surface and the edible detail surface. The temperature of the liquid composition should be 20 0C higher than its cooling temperature, the specific pressure of the casting should be 30-35 MPa, the time to stand under pressure should be 20 hours. After that, the pressure is reduced pressform is separated. The recovered detail is removed from it, the seams are cleaned, the excess pieces of material that have leaked are removed, the detail is thermally processed in oil at a cost of 120-130 0C, for 1.5-2 hours. The detail is then cooled to 110 0C along with the oil and cooled to home temperature in the open. Its dimensions should be checked 24 hours later when plastics pour under pressure [4-5-6].

When preparing car details under pressure from plastic materials, the pressure force retention time and the cost of heating the mold are of great importance. We will consider this on the example of high-and low-pressure polyethene and polypropylene, the maxillary plastic raw materials produced in Uzbekistan in the gas complexes of

Shurtan, Mubarak and Ustyurt.

Conclusion. The following conclusions can be made based on the scientific research carried out, the analysis of the results of the study and the study:

- ✓ the cognitive skills of students increase significantly;

- ✓ connecting students with production processes;
- ✓ that students do not need to re-increase their knowledge after getting a job.

With this, it will be possible to increase the level of knowledge of students several times and develop mature quality personnel necessary for the development of the country.

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