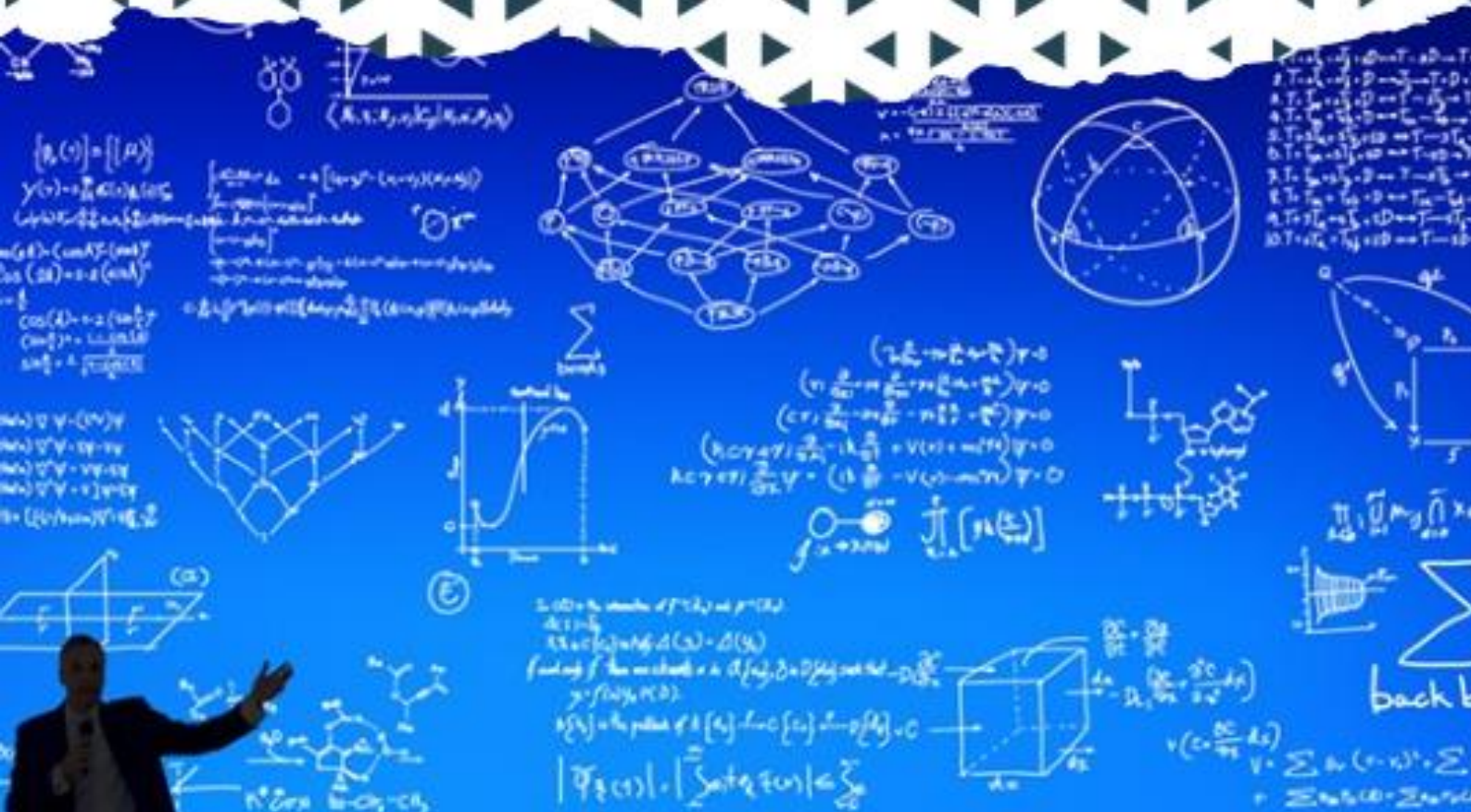




INNOVATIVE WORLD
Ilmiy tadqiqotlar markazi

ZAMONAVIY ILM-FAN VA TA'LIM: MUAMMO VA YECHIMLAR ILMIY-AMALIY KONFERENSIYA



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2026



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**«ZAMONAVIY ILM-FAN VA TADQIQOTLAR: MUAMMO VA
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MASOFAVIY, ONLAYN KONFERENSIYASI**

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TECHNOLOGICAL PROCESSES OF COLD STAMPING

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Cold stamping is a part of pressure treatment for metals, which is divided into five different types of pressure treatment for metals these are 1-Rolling, 2-pressing, 3-grinding, 4-hammering, 5-volumetric, 6-List stamping methods for working metals with pressure are becoming more and more common in various branches of the metallurgical and mechanical engineering industries. These methods produce high-quality products due to the high-speed, high-volume processing of plastic blanks.

Below are the main methods and information about them.

1. Rolling. This method involves rolling large cast blanks by passing them through the rollers of rolling machines (mills) rotating in opposite or one direction. In this zagotovka changes in size, shape and dimensions. There are the following types of rolling: a) longitudinal rolling. This process is called longitudinal rolling, in which the workpieces are rolled through the rollers of the rolling mills in the opposite direction.

a) Longitudinal rolling. This process is called longitudinal rolling, in which the workpieces are rolled through the rollers of the rolling mills in the opposite direction.

b) Cross rolling. In this processing, zagotovkas are called rolling to work by crushing them between the juvs of a rolling machine, the ends of which are parallel or at a certain angle.

2. Press. This process is called pressing the zagotovka press machine (the so-called container) into the khoval cylinder, squeezing it with the puanson and crushing it out of the so-called Matrix tool itself.

3. Forging. This process is called forging, in which the workpieces are placed on the lower die of the forging machine (in the case of manual forging, on the anvil) and struck with the upper die.

4. Volumetric stamping. In this process, the workpieces are placed in the lower die of a tool called a stamp and are punched with the upper die, which is called bulk stamping.

5. Sheet stamping. In this process, list zagotovkas are called list stamping to work by placing them on a tool called a matrix and pinching them with a press machine Poisson and inserting them into the die.

Basics of processing under pressure. The essence of metal forming under pressure is that plastic metals and alloys change their external shape under the influence of an external force or pressure and retain this shape after the action is stopped, that is, they undergo plastic deformation. Accordingly, most metals (steel, bronze) are not produced under pressure. This method is the most progressive if metals have been known since many times to work under pressure. Because of the low amount of discharge of metal, the yield of work is large and the resulting product is high. Because the physical and mechanical properties of the metal are improved by working under pressure. When a metal is worked under pressure, in addition to changing its shape, its internal structure and properties also change. More than 80% of molten steel is processed by the method of working metals under pressure. More than 60% of non-ferrous metals and alloys are processed under pressure, as well as many parts of plastics and metalmasers. Under pressure, blanks, semi-finished products, products, and parts weighing from 10 g to 100

tons are obtained. Working under pressure is a very complex process, with much more changes on the outside surface and inside the piece. Physical and mechanical changes in an item lead to occurrence. The part is first elastically and then plastically deformed under the influence of an external force.

Materials used in cold stamping. Material assortment. Cold-formed sheet metal is widely used in the form of sheet, strip, and tape, and in some cases in the form of round wire and individual-sized blanks (blanks). The List is used in cases of stamping with not very large batches or stamping large gabaritic (dimensional) details. When processing the list, a lot of waste comes out and stamping productivity is low. The sheet will have a non-uniform thickness and non-uniform mechanical properties along its width, leading to different deformation conditions.

Design of a corona beam detail in cold forming. The Kronstein detail is considered one of the most important structural elements widely used in the fields of Mechanical Engineering and construction. This detail mainly functions to attach, fasten various mechanisms and structures and ensure their mutual location. Brackets are usually subjected to static and dynamic loads. Therefore, their design must be strong, reliable, and designed for long service life. The shape of the part is often a complex geometric shape made of sheet material, with holes and folded parts. For the preparation of this detail, a low-carbon steel material was selected. This type of Steel has high plasticity due to its low carbon content and is well given to deformation. At the same time, it has good weldability and facilitates the machining process. One of the important advantages of low-carbon steel is its suitability for cold stamping. This material can be deformed to a large extent without cracking, which allows for high-precision and high-quality manufacturing of parts. Taking into account the constructive features of the Kronstein detail, it is advisable to use the cold stamping method in its manufacture. With this method, the detail can be prepared in a short time, with little waste and with high productivity.

The technological process. The technological process for manufacturing the bracket part by cold stamping was selected to consist of three main operations. These operations are performed in sequence, taking into account the shape and structural features of the part. The first operation is the process of extracting (cutting) the contour of the detail from the list material. At this stage, the outer shape of the detail is cut out of the list material using a stamp. The cutting process is performed in high accuracy, and the geometric dimensions of the detail are obtained in accordance with the requirement. The second operation is the process of creating holes in the part (punching). At this stage, all the holes present in the bracket part are punched using a punch and die. Holes serve to attach the detail to other structures, and their location and dimensions are required to be executed in high precision. The third operation is the process of giving (bending or forming) the final shape to the detail. At this stage, the part is given the necessary geometric shape and its functional properties are ensured. As a result of the bending process, the strength of Kronstein increases, and it is made suitable for working conditions. The selected technological process is considered simple, effective and convenient to apply in production conditions. This sequence allows for high-precision, low-waste, and short-time preparation of the part.

I designed the punch and die based on the detailed drawing given to us. Since the mold was expensive for me economically, I did it quickly using modern CAD, CAM, CAE systems.



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