STAMPING ON THE BASIS OF MODERN TECHNOLOGIES AND ITS ESSENCE

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ABSTRACT

The article describes the history and advantages of stamping technique, its types, principles of operation in the world of engineering and technology.

Keywords: technique, stamping, metal, technology, history, mechanism, bending, size, foundation.

INTRODUCTION

Today, when we live in an era of rapid development of engineering and technology, smart technologies are making people's work easier, and we can see a bright example of this in every factory and plant. We would like to take a look at the stamping activity and its specific history below.

If the production requires a large number of metal parts or blanks of the same sample, the use of the stamping method is recommended. Metal stamping is made of sheet material deformed specifically to the desired shape by printing. Stamping on metal objects has been used since ancient times: many centuries ago, our ancestors made jewelry, weapons and household items. Then this was done manually and at a much lower speed, now the process is automated and the production of part of it takes much less time.

The mechanization of the process began in the 1850s. Then the machines began to be connected to the metal stamping process, which significantly accelerated the production process and improved product quality. In the 5th century, a new automobile appeared in the production of metal parts through stamping, which stimulated the development of the automotive industry. Using this method, some details of car bodies and mechanisms began to be created. Since the 1930s, stamping of plastic metal parts has been used in aircraft and swimming shipyards. And 20 years later, it was introduced into the rocket industry. The metal stamping method has become popular for a number of reasons:

- The production process is mechanized and automated using rotor-conveyor lines, which allows to accelerate production as much as possible;

- can produce parts of any shape and parameters, they can be a work piece or a finished product;

-Manufactured parts have high accuracy, which allows them to be replaced with each other without changing tools or equipment;

-can produce high-strength lightweight products.

Sealing of metal parts is also used for large-volume products used as a cavity in the construction of automobiles, ships, aircraft, and for small lighting parts such as watch hands. Stamping is known for the high speed of production of such products and the almost limitless possibilities of producing inseparable parts of any size, which is very important in the construction of ships and trains.

To prepare parts by stamping using metal plates, thin steel tape or tape. Most parts are manufactured by cold stamping plastic metal. In the production of these types of parts, the metal has additional strength, which increases the service life of the product. Hot stamping equipment is used when it cannot provide the necessary strength to turn the cold metal into the desired shape. Or when making non-flexible metal parts. For hot-rolled parts, plates with a thickness of less than 5 mm are obtained. The choice of subsequent production technology

depends on how the metal is to be moved, i.e. the product shape change technology differs from the method used for separation. As a result of the separation operations, the part is separated from the part.

This can be done in a curve or a straight line or contour. The metal is separated in different directions by the moving parts of the work piece. Several operations are used for separation, using a press with special tools.

Cut - Metal billet parts separated by a curly line or a straight line. This type of operation is called press scissors. This operation produces ready-to-use parts and blanks, which are then processed in other ways.

Notching is the operation of cutting an incomplete part of a work piece under pressure while maintaining the integrity of the part.

Cutting - a small part of the work piece is removed and some of the metal goes to waste.

Punch - holes of different shapes are formed on a metal sheet. Part of the metal base is considered waste and must be disposed of.

Felling - creates a product from a work piece whose contour is closed.

Shaving - removes uneven edges and allows the product to look beautiful by aligning the edges.

Perforation (perforation) - depressions are made in the product using a conical tool.

There are several types of stamping that form parts. These types of operations are used to change the shape and size of the work piece from a metal sheet without destroying the material.

Types of deformation operations:

Flanged holes are the formation around the holes of billet cavities of the desired shape and size.

Contour hanging is the formation along the contour of the product of the sides of the desired shape and size. Typically, this method is used to process pipe ends to fix flanges.

The hood is a three-dimensional stamping, as a result of which a hollow cavity is formed inside the flat metal plates. In this way hemispherical, box-shaped, conical, cylindrical and other parts are produced. The hat can be in series, in a flat matrix or with a clasp.

Crab - narrowing the ends of parts made of metal construction, using a hollow cone matrix. The end of the section is inserted into the funnel of the matrix with great force.

Bending - metal billets are given the desired twist in the design. Depending on the final shape of the product, there are several types of bending: V-shaped or single-angle, U-shaped or double-angle, polygonal, tubular and curved.

Forming - without changing the contour of the product, the size and shape of its sections change. There are several types of molding: it can be pre-assembled and done with a cylindrical punch with a flat tip.

Cold stamping is suitable not only for products made of alloys and carbon steel, but also for alloys of aluminum and these metals. The choice of materials stamped with this method may deviate from the metals. These types of brands can be used to make parts from cardboard, leather, polymer alloys and rubber.

The products used in cold stamping of metal are characterized by high strength, accuracy of parameters and shapes, as well as surface quality. But at the same time, when the metal is cold stamped, the flexibility of the material decreases. Due to the increase in strength, the metal becomes brittle, which is one of the obvious disadvantages of metal processing.

The work piece is affected to prevent such negative moments between operations performed during cold stamping. This is called crystallization softening.

Using this technology, the finished products combine the increased strength of the cold stamped product with the flexibility before metal processing.

In order to choose the press and design used, you need to know and take into account the many characteristics of the raw material from which the product is made. Otherwise, the quality of the product or the equipment itself may be damaged. An individual stamp is prepared for each product type according to the parameters required to perform stamping operations. This is done in several stages. Material cutting patterns are studied and checked in a specialized computer program.

If the program or person determines that the sketch does not meet the actual requirements, the sketch will be edited. The development is checked for compliance with the dimensions. The sketch shows the exact dimensions and location of the holes on the working side of the stamp.

In preparation for stamping, the following is taken into account:

Electrical conductivity and magnetic permeability of the material used.

Resistance to mechanical stress and hardness of metal.

The impact strength of the metal used.

The weight of the work piece.

The abrasion resistance of the metal and its corrosion resistance affect the life of this sealed product.

Thermal resistance and thermal conductivity of the processed metal. Stamping of plastic is done using a press and a stamp. The press is used to create the printing, i.e. the stamping process itself and the stamp gives the product the desired shape. The brand is made of steel and consists of a punch and a die.

The deformation process takes place using a punch and a die as they approach. The upper half of the stamp mounted on the text, i.e. the slider, slides. The lower half remains immovable and is located on the working surface of the equipment. If it is not stamped steel, but the material is soft, then the working parts of the stamp can be made of polymer alloys or wood.

When stamping a large piece, a special device made of cast iron or concrete matrix and a container with a liquid (usually water) are used, rather than a press that is typically used. A metal sheet is placed in the die and a liquid punch is placed on top of it. To create pressure in the liquid, a powder-based charge is blown into the container or the water is electrically charged with sufficient force so that the metal is deformed to the desired shape. Our experienced specialists have the experience left behind to guarantee the high quality of the equipment produced, strict adherence to all customer requirements and timely execution. Stamps are necessary for the preparation of similar parts by applying high pressure to the work piece (stamping), during which time the metal is deformed according to a prefabricated template.

Stamps are made to order, they meet the highest requirements for reliability, accuracy and quality, because the appearance of the product depends on such equipment. The simplest and most complex parts are used using stamps. The minimum production time is 10 working days and depends on the characteristics of a particular product, the availability of a suitable work piece and other factors. You can order not only equipment from us, but also metal stamping and other metalworking services in the field. Stamps are used to produce a wide range of shapes: from the insignificance of a watch on the wrist to the side members of a large truck. In the automotive and shipbuilding industries, large mechanical devices produced by stamping plates are used and then they are welded to a piece. By ordering the production of brands from us, you can carry out the production of even the most complex thin-walled parts.

As a technological process of processing metal products, stamping allows to obtain a flat or bulky finished product that differs in terms of shape and size. Stamps mounted on a press or other type of equipment can be used as a working tool during stamping. Depending on the conditions of execution, metal stamping is hot

and cold. These two types of technology involve the use of different equipment and compliance with certain technological standards. This is primarily due to the very high complexity of such a technological operation, as for its high-quality operation it is necessary to pre-calculate and accurately monitor the level of heating of the work piece. Using hot-stamping, critical products of various thicknesses, critical parts such as boiler bottoms, and other products such as hemispheres, hulls, and other elements used in shipbuilding are obtained. Heating devices that provide precise temperature conditions are used to heat the metal parts before hot stamping. In this function, in particular, electric, plasma and other heating devices can be used. Before starting hot stamping, it is necessary not only to calculate the heating standards of the work pieces, but also to develop a clear and detailed drawing of the finished product, which takes into account the shrinkage of the cooling metal. When making metal parts, the process of forming the finished product occurs only due to the pressure applied by the working elements of the press on the work piece. They do not shrink because the blanks are not preheated during the cold forming process. This allows the production of a finished product that does not require subsequent mechanical cleaning. Therefore, this technology is not only more convenient, but also a cost-effective option.

REFERENCES

1. Nomanjonov, S. N. (2020). Increase The Wear Resistance And Service Life Of Dyes Based On Modern Technologies. The American Journal of Engineering and Technology, 2(12), 67-70.
2. Nomanjonov, S., Rustamov, M., Rubidinov, S., & Akramov, M. (2019). STAMP DESIGN. Экономика и социум, (12), 101-104.
3. Тешабоев, А. Э., Рубидинов, Ш. Ғ. Ў., Назаров, А. Ғ. Ў., & Ғайратов, Ж. Ғ. Ў. (2021). Машинасозликда юза тозалигини назоратини автоматлаш. Scientific progress, 1(5).
4. Рубидинов, Ш. Г. У., & Ғайратов, Ж. Г. У. (2021). КЎП ОПЕРАЦИЯЛИ ФРЕЗАЛАБ ИШЛОВ БЕРИШ МАРКАЗИНИНГ ТАНА ДЕТАЛЛАРИГА ИШЛОВ БЕРИШДАГИ УНУМДОРЛИГИНИ ТАҲЛИЛИ. Oriental renaissance: Innovative, educational, natural and social sciences, 1(9), 759-765.
5. Рубидинов, Ш. Ғ. Ў., & Ғайратов, Ж. Ғ. Ў. (2021). ШТАМПЛАРНИ ТАЪМИРЛАШДА ЗАМОНАВИЙ ТЕХНОЛОГИЯ ХРОМЛАШ УСУЛИДАН ФОЙДАЛАНИШ. Scientific progress, 2(5), 469-473.
6. Юсуфжонов, О. Ғ., & Ғайратов, Ж. Ғ. (2021). ШТАМПЛАШ ЖАРАЁНИДА ИШЧИ ЮЗАЛАРНИ ЕЙИЛИШГА БАРДОШЛИЛИГИНИ ОШИРИШДА МОЙЛАШНИ АҲАМИЯТИ. Scientific progress, 1(6), 962-966.
7. Юсупов, С. М., Ғайратов, Ж. Ғ. Ў., Назаров, А. Ғ. Ў., & Юсуфжонов, О. Ғ. Ў. (2021). КОМПАЗИЦИОН МАТЕРИАЛЛАРНИ БОРЛАШ. Scientific progress, 1(4).
8. Mamirov, A., & Omonov, A. (2020). APPLICATION OF VACUUM CAPTURING DEVICES IN MECHANICAL ENGINEERING. Интернаука, (42-2), 73-75.
9. Omonov, A. A. O. G. L. (2021). HAVO YOSTIQLI KONVEYERLARNING FIK NI OSHIRISH. Scientific progress, 1(6), 967-971. Omonov, A. A. O. G. L. (2021).
10. CHUQUR TESHIKLARNI PARMALASH. Oriental renaissance: Innovative, educational, natural and social sciences, 1(9), 91-96.
11. Omonov, A., & Tilobov, B. (2020). THE IMPORTANCE OF GLASSING THE INTERIOR WALLS OF PIPES. In ИННОВАЦИОННЫЕ ПОДХОДЫ В СОВРЕМЕННОЙ НАУКЕ (pp. 196-200).
12. Рубидинов, Ш. Ғ. Ў. (2021). Бикрлиги паст валларга совуқ ишлов бериш усули. Scientific progress, 1(6), 413-417.

13. Рустамов, М. А. (2021). МЕТОДЫ ТЕРМИЧЕСКОЙ ОБРАБОТКИ ДЛЯ ПОВЫШЕНИЯ ПРОЧНОСТИ ЗУБЧАТЫХ КОЛЕС. Scientific progress, 2(6), 721-728.
14. Turakhodjaev, Nodir, et al. "EFFECT OF METAL CRYSTALLATION PERIOD ON PRODUCT QUALITY." Theoretical & Applied Science 11 (2020): 23-31.
15. Юлчиева, С. Б., Мухамедбаева, З. А., Негматова, К. С., Мадаминов, Б. М., & Рубидинов, Ш. Г. У. (2021). ИЗУЧЕНИЕ ФИЗИКО-ХИМИЧЕСКИХ СВОЙСТВ ПОРФИРИТОВЫХ ЖИДКОСТЕКОЛЬНЫХ КОМПОЗИЦИЙ В АГРЕССИВНОЙ СРЕДЕ. Universum: технические науки, (8-1 (89)), 90-94.
16. Nomanjonov, S., et al. "STAMP DESIGN." Экономика и социум 12 (2019): 101-104.
17. Nomanjonov, S. N. "Increase The Wear Resistance And Service Life Of Dyes Based On Modern Technologies." The American Journal of Engineering and Technology 2.12 (2020): 67-70.
18. Тешабоев, Анвар Эргашевич, et al. "Машинасозликда юза тозалигини назоратини автоматлаш." Scientific progress 1.5 (2021).
19. Рубидинов, Шохрух Гайратжон Угли, and Жасурбек Гайратжон Угли Ғайратов. "КЎП ОПЕРАЦИЯЛИ ФРЕЗАЛАБ ИШЛОВ БЕРИШ МАРКАЗИНИНГ ТАНА ДЕТАЛЛАРИГА ИШЛОВ БЕРИШДАГИ УНУМДОРЛИГИНИ ТАХЛИЛИ." Oriental renaissance: Innovative, educational, natural and social sciences 1.9 (2021): 759-765.
20. Рубидинов, Шохрух Ғайратжон Ўғли, and Жасурбек Ғайратжон Ўғли Ғайратов. "ШТАМПЛАРНИ ТАЪМИРЛАШДА ЗАМОНАВИЙ ТЕХНОЛОГИЯ ХРОМЛАШ УСУЛИДАН ФОЙДАЛАНИШ." Scientific progress 2.5 (2021): 469-473.
21. Юсуфжонов, О. Ғ., and Ж. Ғ. Ғайратов. "ШТАМПЛАШ ЖАРАЁНИДА ИШЧИ ЮЗАЛАРНИ ЕЙИЛИШГА БАРДОШЛИЛИГИНИ ОШИРИШДА МОЙЛАШНИ АҲАМИЯТИ." Scientific progress 1.6 (2021): 962-966.
22. Юсупов, Сардорбек Маъруфович, et al. "КОМПАЗИЦИОН МАТЕРИАЛЛАРНИ БОРЛАШ." Scientific progress 1.4 (2021).
23. 22. Акрамов, М. М. (2021). ДЕТАЛЛАРНИНГ ЮЗАЛАРИНИ КИМЁВИЙ-ТЕРМИК ИШЛОВ БЕРИШГА ҚАРАТИЛГАН ТАКЛИФЛАР. Scientific progress, 2(6), 123-128.
24. Mamirov, Abdurashid, and Abduqahhor Omonov. "APPLICATION OF VACUUM CAPTURING DEVICES IN MECHANICAL ENGINEERING." Интернаука 42-2 (2020): 73-75.
25. Omonov, Abduqahhor Abdiraxmon O'G'Li. "HAVO YOSTIQLI KONVEYERLARNING FIK NI OSHIRISH." Scientific progress 1.6 (2021): 967-971.
26. Omonov, Abduqahhor Abdiraxmon O'G'Li. "CHUQUR TESHIKLARNI PARMALASH." Oriental renaissance: Innovative, educational, natural and social sciences 1.9 (2021): 91-96.
27. Omonov, Abduqahhor, and Baxodir Tilobov. "THE IMPORTANCE OF GLASSING THE INTERIOR WALLS OF PIPES." ИННОВАЦИОННЫЕ ПОДХОДЫ В СОВРЕМЕННОЙ НАУКЕ. 2020.
28. Рубидинов, Шохрух Ғайратжон Ўғли. "Бикрлиги паст валларга совуқ ишлов бериш усули." Scientific progress 1.6 (2021): 413-417.
29. Юлчиева, Сурайё Бахрамовна, et al. "ИЗУЧЕНИЕ ФИЗИКО-ХИМИЧЕСКИХ СВОЙСТВ ПОРФИРИТОВЫХ ЖИДКОСТЕКОЛЬНЫХ КОМПОЗИЦИЙ В АГРЕССИВНОЙ СРЕДЕ." Universum: технические науки 8-1 (89) (2021): 90-94.

30. Turakhodjaev, N., Saidmakhamadov, N., Turakhujaeva, S., Akramov, M., Turakhujaeva, A., & Turakhodjaeva, F. (2020). EFFECT OF METAL CRYSTALLATION PERIOD ON PRODUCT QUALITY. Theoretical & Applied Science, (11), 23-31.
31. Рустамов, Мухаммадазим Акбаралиевич. "МЕТОДЫ ТЕРМИЧЕСКОЙ ОБРАБОТКИ ДЛЯ ПОВЫШЕНИЯ ПРОЧНОСТИ ЗУБЧАТЫХ КОЛЕС." Scientific progress 2.6 (2021): 721-728.
32. Fayzimatov, S., & Rubidinov, S. (2021). DETERMINATION OF THE BENDING STIFFNESS OF THIN-WALLED SHAFTS BY THE EXPERIMENTAL METHODOLOGICAL METHOD DUE TO THE FORMATION OF INTERNAL STRESSES. International Engineering Journal For Research & Development, 6(2), 5-5.
33. Qosimova, Z. M. (2021). Influence of The Design of The Rolling Roller on The Quality of The Surface Layer During Plastic Deformation on the Workpiece.
34. Mukhammadjonov, M. S., Tursunov, A. S., & Abduraximov, D. R. (2020). Automation of reactive power compensation in electrical networks. ISJ Theoretical & Applied Science, 05 (85), 615-618.
35. Mukhammadyusuf, M., Sherzod, P., & Behzod, A. (2020). Study of compensation of reactive power of short-circuited rotor of asynchronous motor. ACADEMICIA: An International Multidisciplinary Research Journal, 10(5), 625-628.