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DIFFERENT FOR COTTON GINNING RIBS SIMULATION

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Abstract:

We implemented the process of producing a new Rib in three different ways, and we selected the process that was the most affordable and required the least labor, and we did it. The cost of production of mold from raw material of MDF , The cost of production of mold from raw material of Alumina, The cost of production of mold from raw material of Steel.

Keyword

Mould, Rib, Aluminum, MDF (Medium Density Fibreboard) and Steel materials, production, quality

Introduction

Cast iron casting process Pig iron is produced in blast furnaces - huge structures, as high as a ten-story building. After the ore is melted and impurities are removed, the cast iron is cast into steel molds - molds. The resulting ingots (ingots) contain cast iron of a certain grade and are ready for further processing. In foundries, various finished products are cast from them. The main stages of the cast iron casting process:

Preparation of the model of the finished product
Making a casting mold
Melting of pig iron
Mold casting
Extraction of castings and their final processing
There are several methods for making models and preparing molds.[1-6]

It is necessary to plan its model for the production of ribs. We compared the economic performance of this in 3 different ways and calculated which method could achieve the best result at the lowest cost. The first method is made from MDF raw materials, Seconds methods aluminum, third method iron and foam. Using the first method let us:

To do this, we need to make 34 squares of ρ - material density, a=500mm , b=450mm from h=300mm thick MDF. 17 pieces for punch and 17pieces for matrix. 17pieces MDF is pressing by heated each other, pressed, and dried in a pressed state for 2 days. All this cost 700000 Uzbek so'm. The mass of the material is determined by the formula

$$m = a * b * h * \rho; \quad (1)$$

Once the raw material for the mold is ready, it is sent for milling on a modern digital machine to make of rib model.

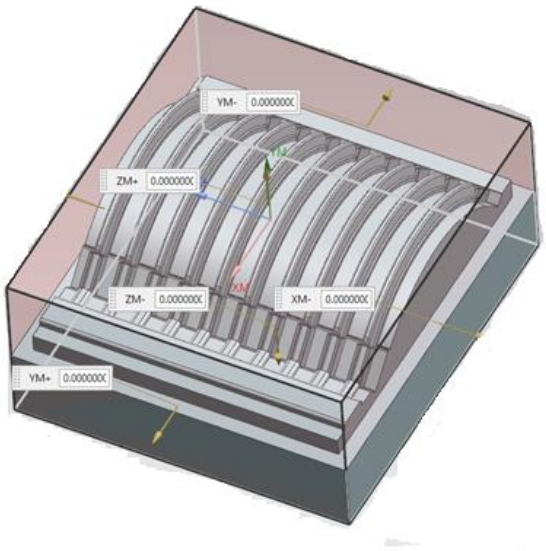
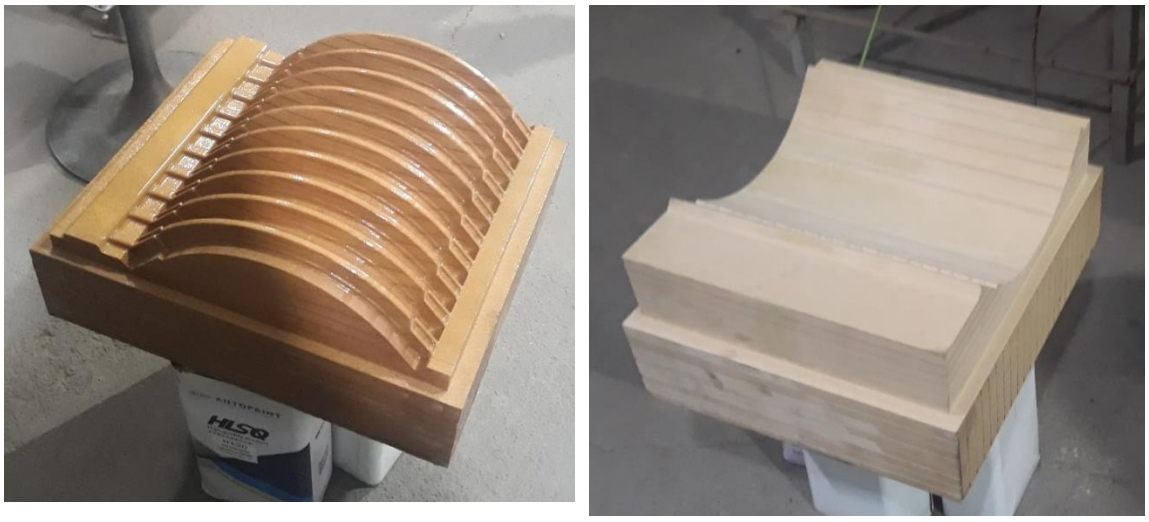


Fig.-1 MDF raw materials

This took a total of 18 hours for the matrix and a total of 17 hours for the punch. 200000 Uzbek so'm per hour were paid for digital devices. The total cost of production of mold (stamping punch and former block) is 7 000 000 Uzbek so'm.



a) b)

Fig.-2 Casting mold from MDF
a) stamping punch b) former block

Once the stamp punch and matrix model molds are ready, they are filled with special sand and a sand mold is made. Cast iron is poured into the finished sand mold.
In this process, we pay only for the number of rib, i.e. how many kg each of them is.
That is, the total weight of 100 ribs is measured and we divide by 100, resulting in one rib weight.

The cost of 1 piece of cast iron is ready for us for 10000 so'ms. After sanding and sand removal with the help of special equipment, one rib will cost 16000 Uzbek so'm

Fig.-3 Ready Rib by MDF mould

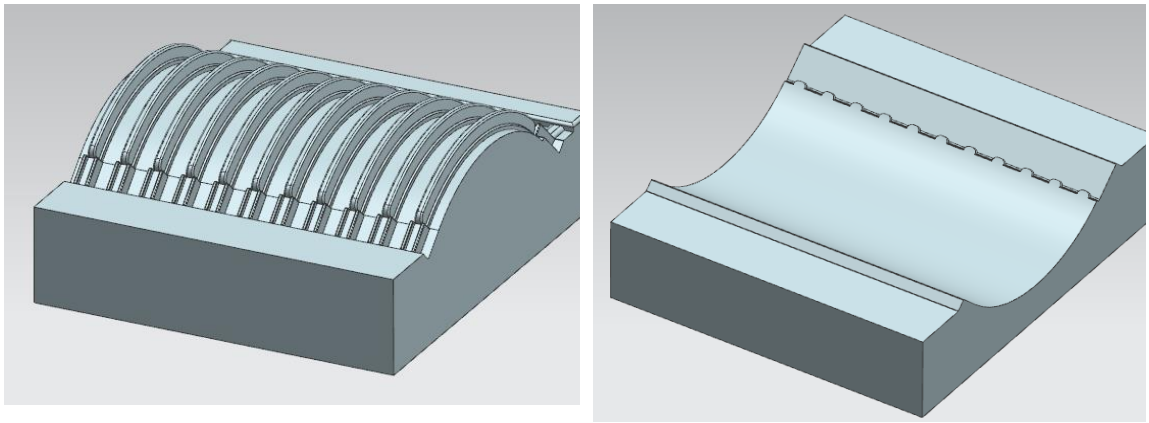
Calculation of a punch and a matrix made of aluminum.

For make mold of stumping punch and matrix out of non-ferrous metal aluminum, we consider how much it will cost. We will need two compacted aluminum sheets of 500 mm by 450 mm and a thickness of 300 mm.

We can say that the density of aluminum is 2.73 grams / mm^2.

Then one mold raw materials weight of 184.27 kg of aluminum was produced. At present, the price of 1 kg of aluminum is 40,000 Uzbek so'm. One-mold raw materials cost 7 371 000 funds, and two cost 14 742 000 Uzbek so'm. This detail is the cost of raw materials.

Then on the digital machine to the detail of milling . It takes 2 times longer to add milling because the hardness level of aluminum on the machine is higher than that of MDF. It takes 70 hours. We charge 200,000 Uzbek so'm per hour. It costs 14 000 000 Uzbek so'm for 70 hours.



a) b)

Fig.-4 Casting mold from Aluminum

b) stamping punch b) former block

Once the stamp punch and matrix model molds are ready, they are filled with special sand and a sand mold is made. Cast iron is poured into the finished sand mold.

In this process, we pay only for the number of rib, i.e. how many kg each of them is.

That is, the total weight of 100 ribs is measured and we divide by 100, resulting in one rib weight.

The cost of 1 piece of cast iron is ready for us for 10 000 so'ms. After sanding and sand removal with the help of special equipment, one rib will cost 16 000 so'ms

Fig.-5 Ready Rib by Aluminiy mould

Puanson and the matrix are made of Steel and cast in foam to account for Rib.

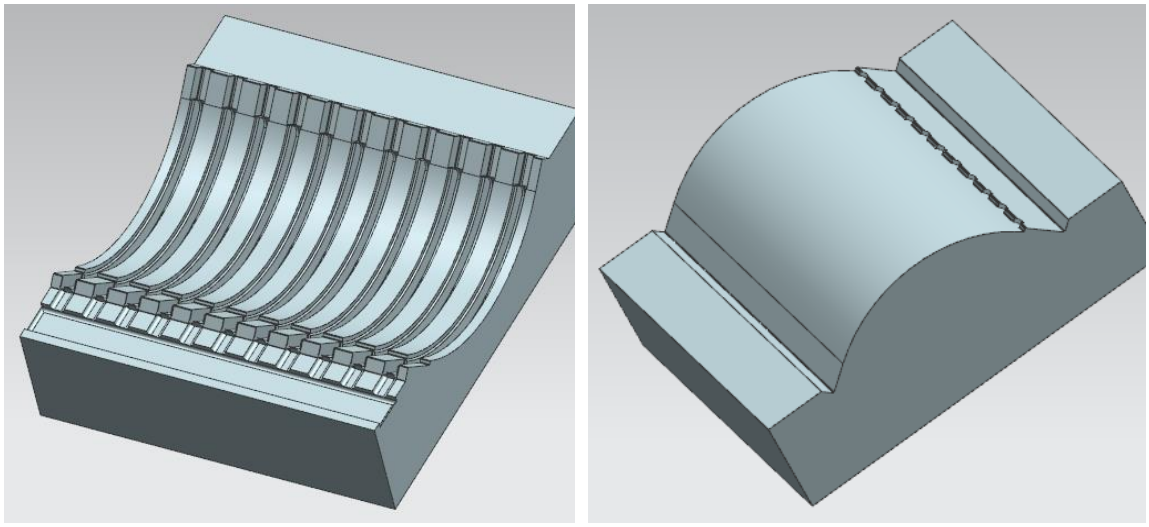
Casting of cast iron according to burnt and smelted patterns.

A copy of the future product is made from a special material with the necessary allowances for shrinkage and subsequent machining. Paraffin, stearin, wax, or mixtures thereof are used for melted models, and for burnt ones, materials are used that burn in air or in an oxygen environment with low smoke and dry residues (as professionals say - with low ash content) [6]. Then, ceramic powders with a silicate binder are applied in several layers (up to nineteen) to the resulting model - no matter whether it is burnt or melted, drying the model after each layer is applied. As a result, a strong heat-resistant crust is formed around the model, into which molten iron will then be poured. But before pouring, the model needs to be deleted somehow [7]. If the model is melt able, then the crust together with the model is transferred to a hot water bath, where the paraffin stearin substance, the melting point of which is 61-75 ° C, melts and successfully leaves the crust. Burnt-out models are handled differently - the mold is placed in an oven and kept for a long period at a high temperature either in air or with oxygen supply - for a more complete and faster combustion of the model (that's why the model is called burnt-out).

To remove combustion products, the mold is blown with compressed air. If the environment permits, the mold is allowed to cool to room temperature before pouring, and the ash residues are washed out with a jet of water or blown out with air. But such a removal of dry residues is not always possible: when cooling, a web of cracks may appear on the crust. Various complex products (pumps, grates, wheels) are cast according to burnt or investment models, where stamping is not possible, as well as artistic casting [8].

One way to produce ribs is to use foam as a raw material. Let us calculate the economic value of this.

To do this, we first need a punch and a matrix mold to pour the foam. From it we pour foam in the form of ribs, and then with the help of special sand we bury it and make a hole, and from the hole we pour molten metal and get a coil. This is an effective but costly method, as it requires a long labor and cost. We get a blank from the first iron. [9].



a) b)

Fig.-6 Casting mold from Steel

c) stamping punch b) former block

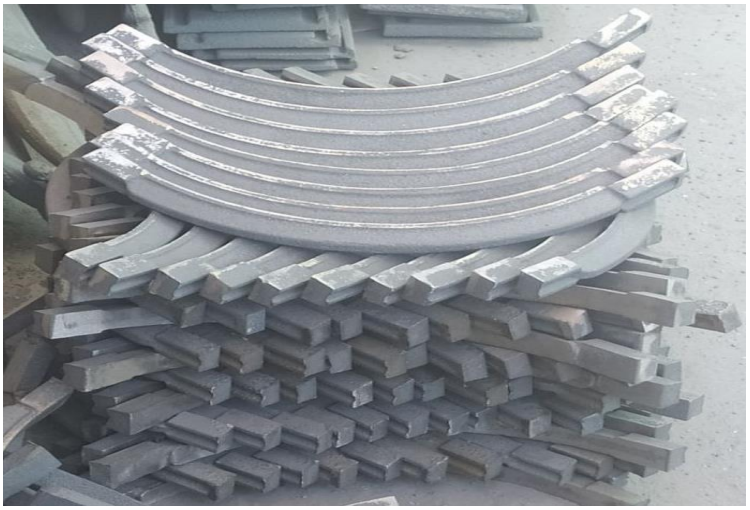


Fig.-7 Ready Rib by Steel mold with

For make mold of stumping punch and matrix out of steel, we consider how much it will cost. We will need two compacted steel sheets of 500 mm by 450 mm and a thickness of 300 mm. [10].

We can say that the density of steel is 7.85 grams / mm^2. Then one mold raw materials weight of 529.88 kg of steel was produced. At present, the price of 1 kg of steel is 8000 Uzbek so'm. One-mold raw materials cost 4239000 funds, and two cost 8478000 Uzbek so'm. This detail is the cost of raw materials. [11-12].

Table 1 Shows the costs of manufacturing punches and dies from various materials and the cost of the manufactured ribs.

Name of mold	Raw materials cost	CNC detail of milling cost	One rib costs
MDF	700 000	7 000 000	16 000
Alyuminiy	14 742 000	14 000 000	16 000
Steel penoplasdan	4 239 000	28 000 000	20 000

Then on the digital machine to the detail of milling. It takes 2 times longer to add milling because the hardness level of steel on the machine is higher than that of aluminum. It takes 140 hours. We charge 200,000 Uzbek so'm per hour. It costs 28 000 000Uzbek so'm for 140 hours.

The next process is to pour the foam into a mold, get a foam die model and take it to the smelter. A foam rib model costs 5,000 soums, and when remitting metal, a total of 1 grate costs 20,000 soums. The reason is that there is no need to give the grate to the grinding process, because the grate comes out with high precision. [13].

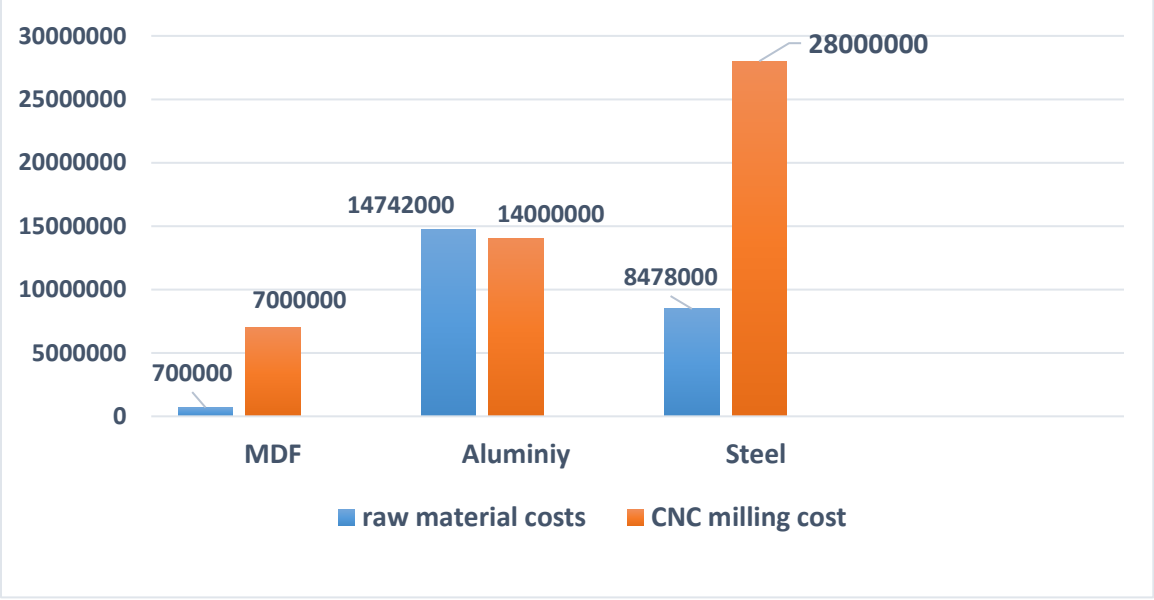


Fig.-8 Statistical graphics of cost

Conclusion

We implemented the process of producing a new Rib in three different ways, and we selected the process that was the most affordable and required the least labor, and we did it. That is, we designed a punch and matrix model from MDF and applied it to production. During the implementation of these processes, we carried out the production of casting metal into molten press sand for the production of punches and dies for ginneries, machine-building enterprises.

The cost of production of mold from raw material of MDF (stamping punch and former block) is - 700 000 Uzbek so'm plus CNC milling operation cost 7000 000 Uzbek so'm. Total Cost for MDF mold 7700 000 Uzbek so'm. This mold for production small party from 15000 to 20000 pieces rib for gin. The cost of 1 piece of cast iron is ready rib 10000 Uzbek so'ms. After sanding and sand removal with the help of special equipment, one rib will cost 16000 Uzbek so'm.

The cost of production of mold from raw material of Alumina (stamping punch and former block) is - 14 742 000 Uzbek so'm plus CNC milling operation cost 14 000 000 Uzbek so'm. Total Cost for Alumina mold 28 742 000 Uzbek so'm. This mold for production middle party from 30000 to 50000 pieces rib for gin.

The cost of production of mold from raw material of Steel (stamping punch and former block) is - 8478 000 Uzbek so'm plus CNC milling operation cost 28 000 000 Uzbek so'm. Total Cost for Steel mold 36 478 000 Uzbek so'm. This mold for production middle party from 80000 to 100000 pieces rib for gin. The next process is to pour the foam into a mold, get a foam die model and take it to the smelter. A foam rib model costs 5,000 Uzbek so'm, and when remitting metal, a total of 1 grate costs 20,000 Uzbek so'm

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