

Advantages and Disadvantages of Using Single Sand-Clay and Melting Model of Casting For Production of Industrial Milling Armor from Secondary Inorganic Materials

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Abstract. this article is written about the disadvantages and advantages of casting methods in obtaining armor coatings for industrial mills from secondary inorganic materials.

Keywords: steel, secondary steels, inorganic materials, sand-clay mold, melting mold.

Introduction. As far as we know, the most common method of ingot production is casting in sand-clay molds, which accounts for up to 75% [1] of the total volume of ingot produced.

There are three main methods of casting semi-self-grinding mill armor: casting in sand-clay molds (hereafter QGQ), gas model casting (GMQ) and casting using cold hardening compounds (SQA).

Casting in one-time sand-clay molds is the cheapest and most common method [2].

For the production of one-time sand molds, a variety of modeling equipment is used, including: models and model plates, rod boxes, drying plates, devices for adjusting and controlling molds and rods, rods, rods for connecting rods. The models are made of wood, metal alloys and plastics and can be steered to form spaces where signs are placed.

The basis of the mold material is sand, which is important for its good fire resistance, heat capacity, heat conductivity and other properties. Another important component of the mixture is the material that provides the main properties of the mixture - strength, plasticity, gas permeability, etc. In addition, small amounts of various additives are added to the mixtures to give them special technological properties. In foundries, previously used waste mixtures are used for process efficiency and stability, including grinding and extraction of metal dross and skardovin, as well as homogenization of the composition of the mixture.

Various clays are used to combine sand: kaolin, bentonite, kaolin-hydrolyses and polyminerals are used [3].

As non-sticky materials, graphite, coal and coal, coke, talc, marshalite, zircon work, they work in the form of paints and pastes, and in some cases they are added to the mixture.

The following technological operations are performed for the preparation of molds: molding the exact shape of the model in the mixture and pressing the mold, making gas channels, removing the model from the mold, finishing and powdering the surface surfaces, assembling the mold.

The methods of preparation of sand-clay mixtures are selected depending on the complexity of the casting configuration, serial production, and the desired casting quality, taking into account the costs associated with mold preparation [4].

Molds are made by hand, molding machines and automatic lines.

Disadvantages of casting in sand-clay molds include:

- there is a great need for production facilities to accommodate the necessary materials and a fleet of auxiliary equipment for their processing;
- solving the ecological problem (the problem of processing a large amount of industrial waste) ;
- costs of additional processing of casting surfaces due to insufficient accuracy and quality of casting surfaces;
- a decrease in the crystallization rate of thick-walled castings and, as a result, a negative effect on the mechanical properties of the casting;
- unfavorable working conditions in the foundry.

Therefore, for the production of armor, it is necessary to choose a casting technology that is free from these defects.

Another possible method of casting armor is the method of casting gas models. Its essence is the production of disposable models made of polystyrene with a density of up to 10 kg/m^3 .

The advantage of this process:

- reduction of labor costs at the stages of cutting and pressing in the production of mold models;
- reduction of technological operations in the total production cycle;
- greater use of mechanization and automation tools;
- in the course of its implementation, there is no need for large economic sums, especially in the conditions of individual and small production.

Disadvantages of the process include:

- the instability of casting quality due to the harmfulness of decomposition products of the model released into the atmosphere of the workshop and the formation of specific defects;
- non-reusability of the material in the disposable model and the release of toxic products as a result of its thermal reaction, which requires appropriate protective measures.

The use of vacuum during casting allows the thermal separation products to be directed to catalytic devices for final processing [5]

Literature

1. Dibrov I.A. Sostoyanie i perspective liteynogo production Rossii: Vystuplenie na XI Sezde liteyshchikov v Ekaterinburge September 16-19, 2013 / I.A. Dibrov // [Electronic resource]: Mode friendly: <http://www.unido-russia.ru>
2. Laskov N.A. Vliyanie konstruksii i pologeniya horizontalnykh litnik o - vyx system na defectnost lityx plit / N.A Laskov , A.V. Karpinsky, V.M Tkachev // Liteyshchik Rossii. - 2009. - no 6. - S. 36 - 40.
3. Laskov N.A. Defektnost lityx asymmetricno orebrennyx plit iz stali 110G13L / N.A. Laskov , A.V. Karpinsky // Liteyshchik Rossii. - 2009. - No. 12. - S. 29 - 31.
4. Erdakov I.N. Vliyanie mestopologeniya pribyli na kachestvo izgotovleniya krupnogabaritnyx drobyashchix plate / I.N. Erdakov , V.M. Tkachev // Nauka i te x- nology . Kratkie soobshcheniya XXX Rossiyskoy school, posvyashchyonnoy 65-letiyu Big Pobedy. - 2010. - T.1. - S. 54 – 56.
5. Trukhov A.P. Technology liteynogo production: lite v peschanye formy/ A.P. Trukhov , Yu.A. Sorokin, M. Yu. Ershov i dr. // M.: Academy, - 2005. - 528 s.