

1. **O.A. Broitman, E.R. Dubova.** Improving the approach to assigning the properties of molding mixtures in computer modeling formation of castings

**Annotation.** Modeling by means of computer modeling systems of foundry processes is considered: mixing, compaction during molding, curing of the mixture, the stability and behavior of its individual components, the chemical interaction of the mold material with metal.

**Keywords:** foundry production, computer modeling, casting formation, algorithms, models.

2. **B.V. Ovsyannikov, V.N. Timofeev, G.P. Usynina, N.V. Maidina.** The effect of the electromagnetic field during the crystallization of ingots of small diameter on the properties of pressed products made of aluminum deformable alloys

**Annotation.** The production of casting ingots with a diameter of 70 mm from aluminum deformable alloys into an electromagnetic crystallizer is considered. The quality of these ingots is evaluated with ingots cast into a graphite crystallizer with a hot top.

**Keywords:** ingot castings, electromagnetic crystallizer, graphite crystallizer, plasticity of ingots.

3. **V.V. Smirnov, S.P. Pavlinich, R.F. Mamleev.** Determination of the thermal conductivity coefficient of electrocorundum shell form on a silica-soil binder technological method

**Annotation.** The results of determining the value of of an electrocorundum shell on a silica binder by a technological method for use in simulation calculations in the ProCAST software package for the formation of large-sized complex-profile castings from VT6L and VT20L titanium alloys are presented.

**Keywords:** technological method, thermal conductivity coefficient, ceramic shell form.

4. **M.Yu. Shchegolev, A.A. Brechko, F.N. Dmitriev, D.V. Belyaev.** Improvement of the foundry technology for obtaining hull castings from high-pressure castings for power engineering in terms of import substitution

**Annotation.** The article considers the improvement of the foundry technology for obtaining body castings from high-strength cast iron with a spherical graphite shape by studying the system of profitable parts by changing their shape and location.

**Keywords:** high-strength cast iron, profit, shrinkage porosity, defects, modeling.

5. **A.A. Lisovoy, I.S. Tkachenko, A.N. Khudeshenko.** Theory and practice of forming castings according to the «LGM process»

**Abstract.** The development of industry is possible only as a result of the introduction and widespread development of progressive innovative technologies and equipment of domestic production. The Fourth Industrial Revolution is aimed at global robotization, automation and the development of artificial intelligence in people's daily business activities. The company «AKS PLANT» has mastered and manufactures equipment of a wide profile for successful automation and robotization of the «LGM PROCESS».

**Keywords:** LGM process, mechanized and automated LGM lines, production of gasified models.

6. **F.G. Lovshenko, I.A. Lozikov. Obtaining mechanically fused modifying ligatures with a high content of alloying component for the production of chrome bronzes**

**Abstract.** The paper presents the results of a study of the regularities of the formation of granulometric composition, structure and properties of modifying ligatures with a high content of alloying component for the production of chrome bronzes. The kinetics of changes in the physico-mechanical properties of granular compositions depending on the temperature in the grinding chamber and the ratio of the volume of working bodies to the volume of the charge has been studied. The results of the topography of granules and their structure are presented, showing that the granules obtained according to the optimal mode of mechanical fusion are dense bodies with microinclusions of chromium, the maximum size of which does not exceed 15–20 microns.

Based on the results of thermodynamic modeling, thermodynamically justified refractory compounds synthesized in the process of obtaining a ligature have been established, which should effectively perform the role of modifiers of the first kind, ensuring the production of bronzes with a sub-/microcrystalline type of base structure.

The processes of compacting mechanically fused compositions were optimized and the influence of the main technological factors — the heating temperature of coldpressed briquettes and the extraction coefficient during hot pressing on the physical and mechanical properties of compact materials was investigated. The results of studying the structure and properties of the most promising Cu — 20 % Cr composition are presented, which make it possible to identify its microcrystalline type, which persists after prolonged high-temperature exposure during the processing of the granular composition into a semi-finished product, and to conclude about the dispersed nature of its hardening, which additionally confirms the data of thermodynamic modeling on the possibility of mechanical synthesis of nanocrystals of refractory compounds to perform the role of modifiers.

According to the results of the research, a comparative analysis of the properties of the developed ligature and beryllium bronze was performed, establishing the possibility of its use as an independent material for electrical purposes.

**Keywords:** production, composition, properties, sub microcrystalline modifying ligatures, chrome bronzes.