1. **N.A. Kidalov, D.Yu. Grebnev, N.I. Gabelchenko.** Improvement of technology for manufacturing replacement elements of tools for mining industry machines using surface alloying in a casting mold

Annotation. The paper proposes to use surface alloying technology to strengthen the tool elements of mining industry machines. Increased wear resistance of excavator bucket teeth was achieved by obtaining a wearresistant surface layer directly in the casting mold. The powder of high-chromium cast iron of the Sormayt PG-S27 brand, which is widespread in production, was used as a strengthening composition for the working surface of the tooth. The fastening holes of the tooth were also strengthened using finely dispersed chips of high-manganese steel 110G13L in the process of obtaining the casting.

Keywords: steel, casting, surface alloying, hardening, excavator bucket teeth, in-mold improvement.

2. **K.V. Nikitin, V.N. Dyachkov, T.N. Tukabayov,T.V. Golovchansky.** Optimization of the production modes of the steel casting «Housing»

Abstract. Work has been carried out at the SamSTU Central Research Center to optimize the technology for producing the «Hull» casting from the VNL-3 OST1-90093 alloy. It was necessary to increase the tightness of the casting, since the heat node was detached from the melt supply during crystallization. For this purpose, the crystallization temperature regime was changed (the mold temperature was reduced from 850 °C to 500 °C) and the dimensions of the casting LPS. Also, to speed up the casting process, a mold made using additive technology using SLA technology was used. As a result of X-ray inspection and leakproofness tests, the parts were found to be suitable.

Keywords: steel, foundry, technology, optimization, metallurgy.

3. **E.I. Marukovich, V.Yu. Stetsenko, A.V. Stetsenko**. Crystallization of zinc alloys

Abstract. The main structural elements of melts of industrial zinc alloys are elementary nanocrystals of zinc, aluminum, copper and their free atoms. The main crystallizing phases of these alloys are microcrystals of α-phases and η-phases. Their crystallization processes are nanostructured. First, structure-forming nanocrystals of phases are formed from elementary nanocrystals and free atoms. Then the centers of crystallization of microcrystals of phases are formed from them. Among them, structure-forming nanocrystals of phases and free atoms of zinc, aluminum and copper, microcrystals of α-phases and η-phases are formed.

Keywords: zinc alloys, crystallization, nanostructural processes, crystallization centers, nanocrystals, microcrystals of phases.

4. **R.R. Ganiev, E.S. Gaintseva, Yu. D. Tyushev, I.I. Akhmedkhanov, L.F. Ganieva.** Technology of manufacturing products from photopolymer compositions by additive technologies

Abstract. This article presents a new method for manufacturing products from photopolymer compositions using additive technologies. The technology is aimed at improving the accuracy and surface quality of products by polymerizing layers to create a step structure. The method

significantly reduces the mechanical loads that occur when each polymerized layer is separated from the bottom of the bath.

Keywords: additive technologies, photopolymer compositions, ultraviolet polymerization, geometric accuracy, surface quality.

5. **A.A. Filippenkov, V.G. Tsikarev, A.V. Alabushev.** Experience in obtaining cast carbide blanks using self-propagating high-temperature synthesis technology with compaction

Abstract. This paper presents the results of experimental work on producing cast carbide blanks using self-propagating high-temperature synthesis technology with compaction. A fundamental technological scheme for obtaining finished products is demonstrated. The researchers produced drawing die blanks from tungstenfree carbides based on titanium carbide with titanium—nickel or titanium—copper intermetallic binders. The hardness of products with nickel measures 68—70 HRC (85.5—86.5 HRA), while those with copper measure 62—64 HRC (82.5—83.5 HRA). The main disadvantage of the experimental drawing dies, identified during testing at plants in the Ural region, is the presence of microporosity on the working surface of the die. Further research to address this limitation will be conducted following the specified technological variants.

Keywords: cast blanks, self-propagating high-temperature synthesis (SHS), titanium—nickel, titanium—copper intermetallics, tungsten-free hard alloys, drawing dies.

6. **B.T. Sabirov.** Current state of mining and processing of bentonite clays of Uzbekistan

Abstract. The article presents data on the chemical composition of bentonite clays from various deposits in Uzbekistan. The feasibility of mixing bentonite clays from various deposits to obtain higher technological indicators is shown. It is proposed to conduct research to adapt bentonites to the conditions of their use in the foundry industry of Belarus.

Keywords: molding mixtures, quartz sand, bentonite, cast iron and steel castings.

7. **A.V. Protasov, B.A. Sivak**. Development of secondary treatment of non-ferrous metal melts

Annotation. A large number of metals and alloys with a wide range of physical properties used in modern technology, as well as strict requirements for their quality, determine the appearance, intensive development and industrial application of many options for technologies and equipment for secondary refining of melts. In this regard, there is an objective need to systematize the accumulated knowledge and production experience. This article is devoted to the analysis of technology and equipment options used in secondary furnace processing of the most common aluminum alloys widely used in various sectors of the economy. At the same time, it should be noted that many of the described technical solutions can be used in the types of industry.

Keywords: non-ferrous metals, secondary melt refining, aluminum and aluminum alloys, ladle, mixer, bath, jet, stirring, flux, ultrasonic treatment, liquation methods, vacuum treatment.

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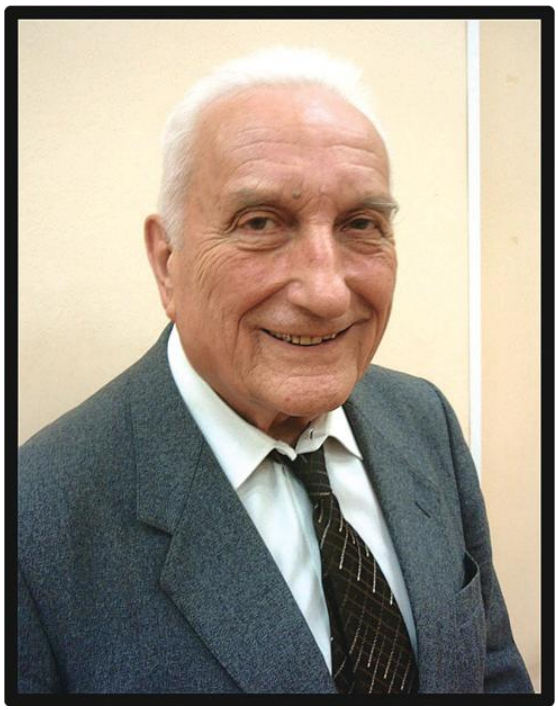
(15.11.1930—14.12.2024)



On December 14, 2024, at the age of 95, **Boris Panteleimonovich Blagonravov**, a veteran of labor, professor of the Department of Machines and Technologies of Foundry Production of the Moscow Polytechnic University, died. The staff of the Department of Foundry Machines and Technologies mourns the death of Boris Panteleimonovich Blagonravov, expresses condolences to his family and friends. Let us keep in our hearts the memory of a benevolent person, a professional foundry worker, who devoted his life to the education of the younger generation.