

1. **V.A. Korovin, I.O. Leushin, A.I. Demchenko, A.A. Kalmykov.** Evaluation of the efficiency of filtration of heat-resistant metal through a foam-ceramic filter on the example of Inconel-718 alloy, smelted in the conditions of PJSC «RUSPOLIMET».

The analysis of literature data has been carried out. It is shown that the filtration of the melt is an effective way to reduce the amount of nonmetallic inclusions in the melt and increase the level of mechanical properties in the finished casting, while the evaluation of the efficiency of the filtration process of superalloys can be the amount and size of nonmetallic inclusions remaining in the metal after the end of casting. Smelting of experimental melting of alloy Inconel 718 was carried out, casting of one billet was carried out through a double ceramic foam filter, and the other without a filter. Templates were selected from each blank for microstructural analysis. Microstructural analysis was carried out using a NEOPHOT 32 microscope. It was found that the use of filtration technology on the Inconel-718 alloy allows cleaning the metal from large oxide non-metallic inclusions, reducing the maximum size of the inclusion by more than 5 times. A decrease in the total number of non-metallic inclusions, as well as inclusions of the minimum size, more than 2 times has been achieved.

Keywords: mechanical properties, non-metallic inclusions, Inconel 718 alloy, metal microstructure.

2. **D.A. Boldyrev, S.G. Prasolov, L.I. Popova, G.V. Muratkin, A.A. Tokarev.** Basic parameters of the process of obtaining PMG.

The general characteristic of CGI is given, the main problem of its production is indicated. Polynomial dependencies of the main mechanical properties of CGI and thermal conductivity on the content of spherical graphite in it are shown. Changes in the mechanical and physical properties of CGI from the content of spherical graphite in it were noted. Listed are 5 of the main methods for producing CGI, of which the first 4 are less used, and the fifth — the most technological. The main features and characteristics of the method of producing CGI by ladle modification of magnesium-REM-containing modifier are described. Recommended furnace and final in casting chemical compositions of CGI are given. Polynomial dependencies of the value of the magnesium-REM-containing modifier suspension and the holding time of cast iron treated with the melt modifier on the degree of compactness of graphite are shown. Influence of pre-treatment of cast iron melt is noted. The most important aspects of CGI production are given.

Keywords: high-strength cast iron, modification, structure.

3. **R.M. Kharchev, A.N. Grachev.** Experience of gravity casting on burn-out models of thin-walled aluminum body blanks for the needs of the aviation industry.

The relevance of the development of technology for the production of thin-walled castings from aluminum alloys for the needs of the aircraft industry is shown. The results of manufacturing the «Turbocharger Body» casting by gravity casting in thin-walled ceramic molds using fired models obtained using the FDM 3D printing technology are presented.

Keywords: aircraft construction, aluminum alloy castings, thin-walled casting, additive technologies, 3D printing of foundry models, FDM process.

4. **Benjamin Hlebec.** Internal processing of pipes of different sizes has never been easier! Installation for automatic cleaning of the inner surface of pipes.

Sandblasting of pipes is one of the key methods for providing the best surface protection in the production of pipelines for the oil, gas and other industries. To ensure a high quality final pipe coating, we typically use preheating, blast cleaning, dust removal and sometimes acid washing processes to prepare the pipes for coating. Internal sandblasting of pipes ensures uniform roughness and surface finish, which is important for preparing pipes for the next process, such as bending and surface protection.

Keywords: sandblasting, surface, internal processing.

5. **A.Popov. Newest Laempe technologies at the plant Inacore.**

The article describes the application of BeachBox core technology to the production of auto parts castings at the BMW plant. Shown are modern types of rod equipment that are used to carry out such a production program.

Keywords: BeachBox process, aluminum castings, auto parts.

6. **K.G. Semenov. Hermodynamics of deoxidation processes of low-alloy nickel alloys.**

The paper deals with the metallurgical and physicochemical processes of melting low-alloy nickel-based alloys and presents an analysis of the thermodynamics of the processes of deoxidation of low-alloy nickel alloys with manganese, silicon, carbon and magnesium. The oxygen concentrations in the melt were determined as a function of the content of the deoxidizing components.

Keywords: low-alloy nickel, deoxidation, oxygen, thermodynamics, manganese, silicon, carbon, magnesium.

7. **G.I. Degtyarenko. Transients in molding mixtures.**

The main reason for the occurrence of transients in the composition of the mixture is the discrepancy between the refreshment mode of the mixture and the actual losses that occur in the mixture during its circulation. The characteristic stepwise nature of the change in the composition of the mixture is noted. The conclusion of the canonical equation of the process is presented, which allows us to monitor the change in the composition of the mixture throughout the entire course of the process, from its initial state to its final one. Examples of calculations of the most characteristic processes that occur when replacing clay materials and sand in a mixture are given, and the effect of the mixture refreshment mode on the speed of the processes is shown.

Keywords: molding compound, the change in the composition of the mixture, transients, stepwise changes in the composition of the mixture, the equilibrium state of the mixture, the canonical equations of transient processes, clay binder, sand, the average diameter of the sand grains, the process of replacing the molding material in the mixture.