

1. **Yu.N. Loginov, S.I. Stepanov, A.V. Korelin, I.A. Naschetnikova.** Hardness anisotropy of titanium cellular structures manufactured using 3D printing.

Microhardness of cellular titanium structures obtained by 3D-printing was estimated. The build direction is taken into account. In this case, in the base lattice of the diamond type, zones of beams and nodes are considered. It is shown that the microhardness on the side surface of the base lattice is higher by about 5% than in the printing direction. It is established that the greatest dispersion of microhardness is characteristic for the direction of 3D-printing.

Keywords: additive manufacturing, selective laser melting, 3D-printing, titanium alloy, cellular structures.

2. **K.N. Vdovin, N.A. Feoktistov, K.G. Pivovarova, T.B. Ponamareva.** Development of composition of magnesite anti-stick paint for high-manganese steel.

In the presented work the results of the study of new anti-stick paint based filler, which is a waste scrap periclasespinel of refractory linings for rotating cement furnaces. The optimal ratio of refractory filler, binder and stabilizer, necessary to maintain a balance between sedimentation resistance and paint density, which ensures its high technological properties, was chosen. The resulting non-stick paint can be recommended for the manufacture of high-manganese steel castings with a significant economic effect and improving the quality of castings.

Keywords: anti-stick paint, metal penetration, metallurgical magnesite, waste scrap periclase-spinel of refractory.

3. **Dynin, I. Muhomorov, A. Tokarev.** The influence of technological deviations at the result of spherowizing treatment of metal.

The technology of ladle treatment is susceptible to the technological parameters as well as many other methods of treatment of metal by modifiers. For obtaining of regular shape of nodular graphite is necessary to take into account external and internal factors.

In paper is listed technological factors and possible deviations from them, described their influence degree on the shape of graphite. The conditional separation of these factors:

1) Factors which influence during ladle treatment (chemical composition of metal, ladle configuration, reaction chamber, cover material, slag in the ladle during treatment, temperature of metal during treatment of metal, dosing of metal mass);

2) Factors which depend on modifier (influence of chemical and fraction size of modifiers).

The degree, of influence of these factors on the formation of graphite in ductile iron castings is explained, examples and consequences of their compliance / noncompliance are given. The need for observance of technological discipline is explained.

Keywords: Bucket modification, spherical graphite, modifier, casting, nodule cast iron, graphite form.

4. **K.G. Semenov.** Metallurgical features of preparation of melting of low-alloyed copper alloys.

The paper considers the effect of impurities on the technological properties of copper. The analysis of the use of the constituent elements of copper as alloying elements is presented. Particular attention is paid to the problem of copper deoxidation, the content of oxygen and hydrogen in the melt.

Keywords: copper, impurities, oxygen, doping, deoxidation, thermodynamics of the interaction in the Cu—O system.

5. **Y.A. Svinoroev, K.A. Batyshev, V.B. Deyev, K. Semenov, P.A. Davydenko.** Searching for efficient methods to improve the binding capability of technical lignosulphonates for creating new binding materials.

Studies have been conducted to identify effective ways to improve the strength characteristics of technical lignosulfonates (LST) as a potential raw material for the production of modern binder materials. Experimental studies were carried out in three directions, suggesting the possibility of increasing the binding capacity of LST: modification, chemical-thermal and thermal activation, combining lignosulfonate compositions with other binding materials (oil USC, CO, SCT and synthetic resins such as CF-O, CF-MT). It was found that the most effective and relatively simple way to improve the binding capacity and stabilize the properties of LST is the process of modification. The most highly effective modifier are nonionic surfactants, leading to a significant (more than an order of magnitude) increase in the binding capacity.

Keywords: binding capacity, modern binders, lignin, technical lignosulfonates, modification, chemical-thermal activation, thermal activation, strength.

6. **A.I. Demchenko, V.F. Shevyakov, V.A. Korovin, S.V. Belyaev, V.N. Guschin.** Improving the quality of nickel alloy by filtration through a ceramic foam filter.

The article presents the results of a study on the application of ceramic foam filters to improve the quality of nickel alloys. It is shown that the use of filtration allows to reduce the amount of non-metallic inclusions and gases in alloys and to improve the mechanical properties of heat-resistant nickel alloys.

Keywords: Filtration, ceramic foam filters.