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«FOUNDRY MEN o f R U S S I A» № 9/2018

1. **E.V. Kolyadov, L.I. Rassokhina, E.M. Visik, V.V. Gerasimov, E.V. Filonov.** Development of technology for casting turbine blades with advanced cooling system from alloy ZhS32-VI.

Technological modes of casting of single-crystal TVD blades from a high-temperature alloy with a crystallographic orientation $\langle 001 \rangle$ with an improved cooling system in installations such as UVNK have been worked out. Received an experimental batch of castings of blades with the casting yield on single-crystal structure is not less than 90%. Ceramic rods of refined granulometric composition with high-temperature sintering additives were used. Control of all obtained castings of blades with non-destructive control methods, investigation of the microstructure of the casting of blades from the alloy ZhS32-VI was carried out.

Key words: refractory superalloys, single crystals, directional, high-temperature nickel alloys, single crystals, directional solidification, macro-etching, micro-etching, large-angle boundaries, small-angle boundaries, misorientation of structural blocks.

2. **A. Mayorov.** Plastic - perspective material for model rigging

The fall of the Russian economy in 2014—2016 has compelled foundryman to take the most careful approach of the cost of casting. Reducing the cost of obtaining products has touched pattern & corebox equipment too. Our article will show whether it is really possible to save money on the pattern & corebox equipment.

Key words: pattern and corebox equipment, forming, model materials, technology for working with wooden pattern, DIN EN 12890: 2000, pattern storage.

3. **Hosen Ri, E.H. Ri, A.V. Goncharov, M.A. Ermakov, V.I. Nikitin, K.V. Nikitin.** Identification of structural components in ligatures for aluminum alloys

Master alloys of Al—Ni, Al—Sc, Al—Sr and Al—Zr type for modification and microalloying of aluminum alloys are obtained. Specific features of microstructure formation have been studied using optical and electronic scanning microscopy. The structural components of aluminum master alloys with Ni, Sc, Sr and Zr have been identified by the micro-X-ray spectral analysis method using analytical research complex based on FE-SEM Hitachi SU-70. Aluminides of nickel (Al₃Ni), scandium (Al₃Sc), strontium (Al₄Sr) zirconium (Al₃Zr) have been identified in the alloys under investigation. Elemental compositions of α -solid solutions and eutectic have been determined. The bulk of the alloying elements are contained in the aluminides of the corresponding metals. In most cases, all intermetallic phases have fine dispersed structure, and are evenly distributed in the ligature. Master alloys are well absorbed in the melt at the temperature of 780 °C.

Key words: ligature, intermetallides, micro-X-ray spectrum analysis, aluminides of alloying elements.

4. **N.D. Feklin, S.A. Medvedchuk.** Basics of designing foundry technology on the casting "Rama side". Vacuum-film molding

The article describes the design patterns of casting technology for castings «side Frame». The conditions of their defect-free formation in vacuum forms, as well as the requirements for their installation on the truck of the freight car are determined.

Key word: vacuum film forming, casting «frame side», special submodel plates, the impact of loads on different sides of the frame.

5. **Yu.A. Svinoroev, V.D. Ryabichev, R. Baer, Yr. Gutko, K.A. Batyshev.** Study of the formation of strength characteristics of lignin-containing substances to create a modern foundry binders

Methods of increasing the binding capacity of technical lignin-containing substances is an effective tool for improving the technological processes of lithium. They make it possible to comprehensively address the issues of resource conservation and ecology, since the expansion of the use of binders based on technical lignin can reduce the use in the production of expensive, usually imported, and environmentally hazardous synthetic resins and oil binders. In this regard, it is advisable to study the processes of formation of the binding capacity of lignin-containing materials for their practical application in the production of castings. It is established that the most effective ways to increase their binding capacity is modification. When using modifiers from the class of NSAIDs, the binding capacity of the composition increases by an order of magnitude (from 0.05 MPa/%, to 0.7 MPa/%). It is shown that the reason for this result is the formation of a three-dimensional mesh polymer with the formation of a strong frame structure of the binder. A pilot batch of small cast iron castings was produced.

Key words: methods of increasing the binding capacity, binding materials, technical lignosulfonates, binding capacity.

6. **G.S. Makarov.** Evolution of aluminium alloys melting.

Evolution of melting techniques for aluminum alloys in the last 100 years is described, as is the competition between flame and electric melting in achieving better performance in furnace productivity, melt loss, energy saving and metal quality. To analyze the logic of development, the concept of Hegel's evolutionary spiral is used. It is shown that the completion of the third coil of the spiral in the 21st century will be the melting of aluminum alloys. It will combine high specific power of plasma with a variety of modern flame furnaces, providing energy saving, ecological compatibility of the melting process, minimal metal losses and the highest level of metal quality.

Key words: flame melting, electric melting, flame hearth, reverberatory electric furnace, flame hearth furnace, channel induction furnace, coreless induction furnace, electromagnetic stirring, electromagnetic pump, shaft furnace, multi-chamber furnace, rotary tiltable furnace, direct-current arc furnace, plasma furnace.

INFORMATION

Press release

Casting for Gasified Models. What's new? International symposium on innovative the process of casting metals

I.A. Dibrov

Trip to Turkey for the International Exhibition

Conference «Import substitution and development of exports of cast products from aluminum alloys»