

Contents of the magazine «Foundrymen of Russia» №6-2020r

1. **E.V. Panfilov.** Features of the modification and crystallization of high-strength cast irons with spherical and vermicular graphite for automotive castings

The article compares the mechanical and physical properties of cast irons with lamellar, vermicular and spherical graphite. Various modification methods for the production of castings for the automotive industry from cast iron with spherical and vermicular form of graphite are considered.

Keywords: cast iron, vermicular form of graphite, modification.

2. **A.Yu. Sidorov, V.B. Deev, V.F. Frolov, S.V. Belyaev, E.M. Lesiv, E.S. Prusov, A.A. Aksenov**
Improvement of crystalizer design for producing large-sized flat ingots from aluminum alloys

Improved designs of molds for the manufacture of large-sized flat ingots from aluminum alloys are considered. These molds are designed for installation on a casting table of the Wagstaff unit during semi-continuous vertical casting of flat ingots. The proposed designs of the molds have a forced lubrication with a two-level water distribution zone at the beginning of casting and a low level of metal during casting, as well as foreign counterparts, but differ from them in more efficient supply of liquid lubricant to the working surface of the mold and more uniform supply of refrigerant to the mold and to the outer surface of the resulting ingot. A feature of the new molds is the presence of a special collector in which an aluminum insert is installed, which increases maintainability and durability during operation. Advanced designs of molds tested in the conditions of existing production and compared with the best foreign counterparts. All ingots manufactured using both new molds and standard Epsilon molds fully met the requirements of the factory technical specification. The created devices have technical novelty, are patented and can be manufactured at Russian enterprises. To further increase production efficiency, an original installation with a heat nozzle for semi-continuous casting of flat ingots has been developed, which allows to improve product quality and reduce the amount of returnable waste.

Keywords: aluminum alloys, semi-continuous casting, large-size flat ingots, crystallizer design.

3. **D.A. Boldyrev, L.I. Popova, S.G. Prasolov, S.V. Davydov.** The influence of structural and chemical features of silicon carbide on the specifics of its assimilation by molten cast iron

When working out the technology of melting the melt of cast iron using silicon carbide a different degree of its assimilation is established both in general and separately for the main elements-carbon and silicon. Based on the results of diffraction and electron microscopic studies with x-ray spectral microanalysis, the real structural and chemical features of industrial silicon carbide are described. The phase composition of silicon carbide is inhomogeneous and consists of particles of crystalline silicon carbide α -SiC and oxidized non-crystalline silicon carbide, which is based on a solid solution «carbon-silicon». Assimilation of silicon carbide by cast iron melt, determined by the growth of carbon and silicon in the smelting process, has an inverse relationship to the content of the α -SiC phase.

Keywords: silicon carbide, x-ray spectral microanalysis, diffraction analysis.

4. **S.V. Vdovichenko Huttenes-Albertus.** Modern Environmental Solutions for the cold-box-amin process

The article presents materials on Huttenes-Albertus environmental solutions for the manufacture of rods according to the Cold-box-amin process. The solutions allow to minimize the emission of harmful substances at the core sections of foundries.

Keywords: core, binder, ecology, environment.

5. **M.L. Kalinichenko, L.P. Dolgiy, V.A. Kalinichenko.** Modern technologies for production of equipment for small-scale foundry

The article presents modern data on the materials used to create model kits, the method of their installation for use on any Casting Workgroups, specializing in the repair and creation of castings by experimental or small-scale batches. The analysis of the materials used, adhesive compositions used for their fastening, as well as economic indicators of the costs necessary for their production were made. The properties of adhesive compositions used for fixing both plastic components of forms and their combinations with metal parts are shown.

Keywords: model tools, foundry, adhesives, plastic model, parts of model kits, mechanical breaking test.