

1. **A.V. Chaykin, S.A. Yakunina, V.M. Kiselev, V.A. Chaykin, K.N. Vdovin.** Increasing the Mechanical Properties of Responsible Castings Produced from Hadfield Steel by Improving the Remelting Method

The purpose of this study is to improve the technological process of the Hadfield steel production by the remelting method, i.e., to improve the mechanical properties of the steel, to decrease its cost, and to expand the range of castings produced from the high-manganese steel by the remelting method. As a result of this study the following benefits have been achieved: reduction of manganese waste during the charge materials melting, diffusive deoxidation of steel efficiency increase, energy and expensive materials savings. To achieve these goals, three ways of improving the steel production by remelting have been applied, i.e., an early slag induction, diffusive deoxidation of steel efficiency increase, an outside the furnace treatment of the steel. At all stages, new dispersed materials developed by Metallurg SOAL LLC were used.

Keywords: high-manganese steel; electric arc furnace; smelting technology; diffusion deoxidation; slag mode.

2. **R.D. Farisov, M.A. Ioffe.** Model for continuous improvement the efficiency of mass cast iron production on Deming cycle

A spiral dynamics model of continuous improvement in the castings quality based on the detailed version of the improving cycle Plan — Do — Check — Act (PDCA) Deming is proposed to increase the efficiency of iron foundry production. The model is suitable for analysing the results of the activities carried out and the effectiveness of corrective actions, it may be useful in determining the bifurcation point and planning for further improvements. According to the proposed model, using the example of mass cast iron production, a quality growth diagram by the Deming improvement cycles has been constructed, which reflects the efficiency obtained from each stage.

Keywords: mass production, the Deming cycle, casting, spiral dynamics, economical production, continuous improvement, quality, performance indicator.

3. **K.K. Shprenger, A.A. Galkin, I.O. Leushin.** Localization of casting production as a tool for import substitution: background and regulatory base

The authors consider the regulatory aspects of import substitution in the Russian Federation as a whole, contributing to the localization of the production of castings and blank production in general on its territory. The article claims to be a reference point for potential investors, shows the direction of effective investment in foundry, and, accordingly, in the development of the Russian economy. It allows you to look at the processes of globalization in an unconventional way and rethink the importance of localizing production in the country as an instrument of the import substitution process, which the Russian Federation has chosen on the way to geopolitical and economic independence in the modern world order.

Keywords: foundry, procurement, globalization, import substitution, localization, technology, autarky, economy.

4. **Yu.A. Svinoroev, K.A. Batyshev, Yu.I. Gutko, K.G. Semenov.** Potential of the practical use of casting binders based on technical lignin

It is proposed to expand the use of binding materials based on technical lignin in the production of casting. Domestic resource base, availability on the market, low price, environmental cleanliness and safety of use in the foundry — make lignin binders a promising direction for the development of casting production technologies. The paper assesses the possibilities of practical application of LST with increased strength properties in the technological processes of casting in this context, it is advisable to use secondary products of processing of vegetable raw materials, by expanding the use of lignosulfonate materials.

Keywords: resource saving, lignosulfonate materials, foundry binders, vegetable raw materials, disintegrator processing.

5. **V.V. Kozlov, M.S. Varfolomeev. Features of the technology of manufacturing corundum casting molds based on ash binders in investment casting**

In this work, the study of the processes of manufacturing ceramic casting molds on water binders in investment casting. The processes of making a suspension under the conditions of using silica ash and alumina binders, as well as testing the obtained ceramic samples are considered. The properties of the finished suspension based on the binders Armosil AM and Aluzol A are analyzed. Comparative characteristics of these materials are presented. Mechanical tests of calcined and uncalcined corundum samples of ceramics based on Armosil AM binder were carried out.

Keywords: investment casting, water-based binders, silica sol, alumina ash, corundum ceramic mold.

6. **A.A. Golovin, E.S. Gaytseva, A.S. Goryukhin. Investigation of the influence of the thermal conditions of the formation of the «Working LPT blade» casting from the TsNK-7P alloy on the formation of shrinkage porosity**

The article discusses the mechanism of formation of shrinkage porosity in the casting, the causes and patterns of its formation. The results of modeling the process of casting and solidification of the alloy under various thermal conditions are presented. The optimal thermal conditions for forming a high-quality casting of the «working TND Blade» part are determined, which meet the conditions of 100% filling capacity of the mold and minimum shrinkage porosity.

Keywords: Niyama criterion, low-pressure turbine blade, shrinkage porosity, thermal conditions of casting formation.

INFORMATION

What, where, when, who, to whom, how much, why?

1. Joint Meeting of the Russian Foundry Association and the Committee for foundry and forging — press production of the Union of Mechanical Engineers
2. International scientific and practical conference «Progressive foundry technologies»