

1. **Adel Nofal.** Austempered ductile iron (ADI). Metallurgical and application advances at cmrdi
2. **E.I. Marukovich, V.Y. Stetsenko, A.V. Stetsenko.** Modification of silumins. Problems. Decision

Abstract. It is shown that the main problems of silumin modification are intensive saturation of melts with hydrogen and aluminum oxide particles. Silumin eutectic modifiers create these problems. It has been shown that the problems of silumin modification can be solved by the use of structural and hereditary modification. No modifiers are needed for this. In the case of structural and hereditary modification of silumins, the modified structure of the remelted castings is inherited by the resulting castings. For the structural and hereditary modification of silumins, castings with a highly dispersed structure are needed. Such castings are obtained by quenching and casting into a jet mold. These casting methods make it possible to obtain castings from silumins with a modified structure without the use of modifiers. When remelting such castings, the duration of the modification effect is 2—3 hours. Structural and hereditary modification of silumins makes it possible to obtain castings with high mechanical and antifriction properties.

Keywords: modification of silumins, structural and hereditary modification, castings, hydrogen, aluminum oxide.

3. **L.G. Znamensky, N.A. Zakharov, E.A. Sinitsyn.** The experience of import substitution of zircon with mulitized materials in die casting

Abstract. The analysis of the replacement of imported zircons with domestic mulitized materials in die investment casting. The properties of forming materials have been studied by quantitative X-ray phase analysis, derivatography, and dilatometry, and the physico-mechanical characteristics of the resulting ceramic molds have been determined. The analysis of the experience of import substitution at INCO LLC (city of Chelyabinsk) and it is shown that due to the use of mulitized material for investment casting, an increase in quality and a reduction in the cost of manufacturing cast blanks for the needs of the oil and gas complex of the Russian Federation.

Keywords: investment casting, import substitution, mullitized materials, zircons, ceramic molds, oil and gas complex, precision casting, high-hardness steel.

4. **S.A. Kulikov.** The effect of cobalt on the properties of cast bronze

Abstract. The results of a study of the effect of cobalt powder modification on the properties of bronze alloyed with tin, zinc and lead are presented. It has been shown that when cobalt powder is added up to 0.1 %, it increases elongation, but does not affect ultimate strength and hardness. With an increase in the introduced cobalt additive to 0.5 %, the strength of bronze increases with a decrease in elongation and hardness. The latter is due to a change in the morphology of the surface of lead inclusions, indicating a transition from viscous fracture to brittle plastic.

Keywords: cobalt, cast iron, bronze, mechanical properties, surface morphology.

5. **V.A. Korovin, A.S. Romanov, M.A. Geyko, I.V. Geyko, D.S. Margun, A.A. Garchenko, V.F. Shevyakov. Improving casting technology**

Abstract. A variant casting technology with the supply of metal into the molds through two holes is proposed.

Keywords: steel, casting, mold, casing speed.

6. **K.V. Nikitin, V.N. Konstantinov, A.V. Knyazev. Integration of digital technologies and foundry production in the production of artistic castings**

Annotation. The main technological approaches for the integration of additive and casting technologies for the production of artistic castings are shown. This direction significantly reduces the preparation time and expands the possibilities of foundry production. It is most rational to use digital technologies to create concepts for future products, digital counterparts of cast elements, as well as for the manufacture of models and model kits when casting on smelted (burnt) models and into molds from cold-hardening mixtures.

Keywords: artistic castings, additive technologies, die casting, casting into molds from cold-hardening mixtures.

7. **L.I. Kondratenko, V.O. Yemelyanov. Prospects for the production of artistic casting based on automation of the development of a composite solution**

Annotation. Modern production of artistic castings requires the use of effective technologies throughout the product life cycle. The stage of developing a composite solution can be based on the principles of industrial design, namely, the psychology of consumption and customization of the casting. The boundary conditions are determined by the comparison method of productive solutions — benchmarking. Production results can be predicted by means of situational analysis. The whole process takes place with the participation of the customer in real time. Physically, the platform can exist as a cloud technology for engineering analysis systems. The main tool of the technologies listed above: database optimization systems — artificial intelligence. The role of industrial designers, technologists, art historians, artists and interested users filling databases. The content includes compositional solutions, discriminating indicators for the construction of composition and critical response options when conducting.

Keywords: artistic casting, composite solution, automation system, situational analysis, comparative analysis, artificial intelligence.