

1. PROTOCOL

Meetings with the performer of the duties of the Director of the Machine Tool and Innovative Engineering Department of the Ministry of Industry and Trade of the Russian Federation E.V. Muratova

2. **R.K. Mysik, S.V. Brusnitsyn, A.V. Sulitsin, I.A. Sokolov, I.A. Gruzdeva.** Study of the structure and properties of aluminum bronze.

This paper presents the results of a study of the properties and structure of bronze ingots of the BrAZhMts 10-3-1.5 brand with a diameter of 200 mm in a cast and pressed state. It is shown that the technology of semi-continuous casting of bronze provides ingots with high strength and plastic characteristics for the production of extruded pipes intended for the manufacture of bearing cages.

Keywords: aluminum bronze, ingots, bearings.

3. **A.D. Shlyaptseva, I.A. Petrov, A.P. Ryakhovsky, V.S. Moiseev.** Modifying flux for casting aluminum alloys

The authors investigated the possibility of modifying aluminum and its alloys with a flux containing titanium dioxide and potassium hexafluorosilicate. It has been shown that during the reduction of titanium dioxide and the transition of titanium into the melt, a modifying effect is exerted on the structures of aluminum and silumin. The influence of flux on the mechanical properties of AK12 alloy is determined.

Keywords: titanium dioxide, potassium silicon fluoride, fluorides, silumin, modification, structure, mechanical properties.

4. **D.A. Boldyrev, B.A. Kulakov, A.A. Tokarev, S.G. Prasolov, L.I. Popova.** A hypereutectic grey cast iron: characteristics of the structure, properties and modification graphics image.

The features of graphite inclusion structures in gray cast iron of lower grades (GGG10, GGG15) depending on the degree of their eutecticity are considered. Based on the results of previous and in-house studies, it was found that primary graphite in non-eutectic gray cast iron, depending on the carbon equivalent, can either remain in the structure or pop up as a speck. The strength properties of non-eutectic gray cast iron are determined primarily by the morphology of graphite and only then by the type of metal base. The difference in the structural features of graphite inclusions of hypereutectic and eutectic gray cast irons is established. The difficulties and problems of achieving a favorable morphology of the graphite phase in high-carbon hypereutectic gray cast iron are described.

Keywords: high-carbon hypereutectic gray cast iron, modification, primary graphite, stability of properties, structure.

5. **D.I. Marukovich, A. Yu. Belykh, V.A. Kharkov, I.O. Sazonenko, A.M. Kovalev.** Obtaining products from antifrictional chromium-nickel cast iron using lost foam casting.

The technological parameters and structure of castings obtained from antifriction chromium-nickel cast iron by casting according to the lost foam casting method are given.

Keywords: antifriction cast iron, chromium-nickel cast iron, lost foam casting method.

6. **Yu.N. Loginov, S.V. Belikov, S.I. Stepanov, A.I. Golodnov, M.V. Gilev.** Plates for osteosynthesis as an additive manufacturing product of 3D printing.

The issue of additive production of titanium plates for osteosynthesis by 3D printing was discussed. An example of creating a 3D model is given. It was shown that the same model can be used for strength

simulation of four-point bending test. The dangerous sections of the plate with holes and shaped edges were identified. The microstructure of the metal was investigated. Stress relief annealing was recommended to avoid thermal distortion.

Keywords: additive manufacturing, selective laser melting, 3D printing, finite element method, osteosynthesis, martensite, thermal distortion.

7. N.I. Kovrizhny`x, N.N. Sonnenberg. Theory and practice of casting by immersing the mold

The theoretical basis of the process of formation of temperature fields in the casting obtained by casting by immersing the mold. Examples of the use of casting by immersing the mold for the production of various products at industrial enterprises in Russia and abroad are given.

Keywords: casting, heat processes, differential heat transfer equation, specific heat, latent heat of melting, immersion casting, liquid metal bath.

8. G.V. Petrishin, V.M. Bystrenkov, V.I. Odarchenko. Method of providing wear-resistance of the blades lobed mixers.

The results of a study of methods and technology for increasing the wear resistance of mixing blades of blade mixers for molding and core mixtures are presented. The composition of the powder mixture and the technology of hardening of the working surfaces of the blades were developed.

Keywords: increased wear resistance, surface hardening, powder mixtures, flame spraying.