1. **K.V. Nikitin, S.S. Zhatkin, D.A. Dunaev, D.M. Yudin,D.A. Minakov.** Features of volumetric electric arc surfacing in additive and restoration technologies

Annotation. The work provides an analysis and features of electric arc WAAM surfacing, a description of the factors influencing the process of formation of surfacing zones, their structure and properties. The results of studies on additive surfacing of workpieces with Sv-AK5 filler wire and restoration electric arc surfacing during the repair of perforated dies made of 9XC steel with OK TUBRODUR 53 GM filler wire are presented.
The influence of surfacing modes on the structure and properties of the deposited zones of the Al—Si system, as well as on the process of restoring punches of perforated dies made of 9XC steel, is shown. Recommendations are given on the optimal modes of WAAM surfacing when growing workpieces from aluminum alloy AK5 and restoring perforated dies from steel 9XC with filler wire OK TUBRODUR 53 GM.

Keywords: electric arc surfacing, additive technologies, filler materials, structure, mechanical properties, digital model, punch, microhardness.

2. **V.S. Miroshnichenko, Yu.I. Gutko, A.N. Golofaev.** The use of additive technologies in the manufacture of a shell gasifi ed model in vacuum-fi lm form

Abstract. This article discusses the development and research of technological parameters of casting according to shell gasified models in vacuum-film forms. Research was carried out and an experimental model was created using CAD and CAM systems, followed by its translation into a hollow 3D model using a 3D printer made of PLA plastic. Experiments were carried out on models printed on a 3D printer using FDM technology, with subsequent molding of these models into sand vacuum film molds and pouring using aluminum and brass alloys.

Keywords: CAD, CAM, FDM, 3D printer, experimental model, modeling, gasified shell models.

3. **A.V. Kalyaskin, A.A. Antipyev, A.A. Tokarev,I.V. Bakin.** Investigation of defect «dark spots» in ductile iron specimens

Abstract. In manufacturing of castings from synthetic nodular iron various defects periodically occur. Among them is «black spots». The ability of such defect makes it impossible to receive mechanical properties of ductile iron, namely: tensile strength and elongation.
The results of investigation the GGG50 specimens with defect «black spots» with methods electronic microscopy in the article are given, morphology compound of inclusions is presented. Based on analysis the main reasons of defect formation are given, the recommendations for its prevention are proposed.

Keywords: ductile iron, nodular iron, non-metallic inclusions, carburizing process, microstructure, macrostructure, graphite.

4. **P.A. Chugunov, M.V. Erpalov, I.C. Shilov.** Effect of the cooling rate of an iron-chromium-manganese alloy on the chemical composition

Annotation. The technology for obtaining a corrosionresistant alloy based on iron, chromium, and manganese in the ElterM-S induction furnace with subsequent cooling in a crucible, as well

as casting into a graphite mold, is considered. The influence of the alloy cooling regime, as well as the sequence of loading alloying additives, on the chemical composition of the obtained material is established. Based on the experimental results, use accelerated cooling of the alloy with casting into a graphite crucible, with a pre-applied ceramic coating, as well as to add manganese to the melt in order to achieve the desired chemical composition is recommended.

Keyword: graphite crucible, induction furnace, cooling, corrosion-resistant alloy, chemical composition.

5. **V.A. Korovin, S.V. Belyaev, M.A. Geyko, L.M. Bistina, P.A. Sluzov, A.I. Demchenko.** Improving the quality of castings, produced by casting in rod forms by fi ltration refi ning through ceramic foam fi lters

Abstract. The article presents the results of filtration refining of castings obtained by casting into vertically stacked molds. Metal filtration was carried out through foam ceramic filters. The data obtained indicate an increase in the quality of cast blanks and finished products.

Keywords: stack forming, filtration refining, foam ceramic filters.

6. **V.V. Smirnov, S.P. Pavlinich, R.F. Mamleev, F.R. Latypov.** On the question of hydrodynamic calculation of gate-feeding systems in centrifugal casting of large castings from titanium alloys and determination of outfl ow coeffi cients

Abstract. An approach to the issue of hydrodynamic calculation of gating-feeding systems in centrifugal casting of large-sized castings from titanium alloys and determination of the outflow coefficients is presented. The authors of this article have proposed a high-performance LPS for centrifugal titanium casting with a vertical axis of rotation [4], which has shown its effectiveness in the manufacture of large-sized castings from titanium alloys.

Keywords: gating-feeding system, centrifugal casting, titanium alloys.

7. **N.V. Trapeznikov, A.A. Shumkov, M.Y. Rozhkov,V.A. Salimov.** Infl uence of the AlTi5B1 ligature on the mechanical properties of the AK5M alloy

Abstract. The article considers the influence of the AlTi5B1 ligature on the mechanical properties of the aluminum alloy AK5M belonging to the Al—Si—Cu system during smelting in gas furnaces. The dependence of the amount of the introduced ligature on the mechanical properties of the alloy obtained in rod forms is described.

Keywords: AlTi5B1 ligature, modification, cold hardening mixture (CHM), coquille, aluminum, mechanical properties, elongation.

8. **S.A. Ivanov.** Experience of industrial operation of pulse forming equipment at JSC «Beloozersky Power Mechanical Plant» (JSC «BEZ», Belarus)

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