

1. **V.A. Korovin, K.A. Maslov, I.V. Geiko, M.A. Volkov, N.A. Bubnova, A.G. Panov.** The effectiveness of the complex impact on the graphitized steel melt to increase the operational durability of the pressure rolls of the wheel rolling mill.

Experimental work has been carried out to test the pressure rolls of a wheel rolling mill made of graphitized steel. The treatment of the steel melt with Ni-Mo ligatures in the amount of 0.3—0.35% and V-Al in the amount of 0.2—0.3% of the melt mass made it possible to increase the operational properties of the pressure rolls by obtaining the required steel microstructure.

Keywords: pressure rolls, nickel-molybdenum and vanadium-aluminum master alloys.

2. **A.S. Anishchenko, A.V. Koltygin, V.E. Bazhenov.** Influence of zinc on microstructure and mechanical properties in ML19 alloys.

In this work, influence of zinc addition into the ML19 alloys determined on microstructure and mechanical properties with flux-free melting condition. Also determined optimal time of ageing for ML19 and ML19 without zinc. Into the Thermo-Calc software were calculated influence of containing RE elements on freezing range in ML19 and ML19 without zinc.

Keywords: magnesium alloys, ML19, zinc, RE metals, flux-free melting, Thermo-Calc, freezing range, heat treatment, mechanical properties, microstructure.

3. **E.O. Pobegalova, V.A. Ivanova, N.A. Kostenko.** Development of the life cycle of foundry coke.

The article analyses the requirements to the structure of the product life cycle. The life cycle of foundry coke containing 6 stages and 16 stages is developed. Taking into account the requirements of national standards, as well as works on production and use of foundry coke, the description of processes occurring at the stages and stages of foundry coke life cycle is given.

Keywords: foundry coke, product life cycle.

4. **S.A. Tavalzhanskii, I.N. Pashkov, K.F. Koletvinov.** The continuous casting features of small cross-section billets of copper based alloys.

This article is overview of the main features of the continuous casting of small cross-section billets of copper-based alloys. It is possible to significantly increase the efficiency and reduce the cost of manufacturing a large number of lengthy semi-finished products from non-ferrous alloys by replacing the deformation process with continuous casting, or by significantly reducing the cross section of the billet intended for deformation treatment. It is shown, that the upward continuous casting process has a number of technological, economic, and metallurgical advantages over other casting directions for most alloys. The features of billet solidification and defects formation during upward continuous casting are described. The design features of the die mold, the requirements for the properties of the graphite die jacket, the features of casting modes depending on the properties of the alloys are described too.

Keywords: copper and copper alloys; continuous casting; die mold; solidification.

5. **D.M. Anvarov, A.Yu. Titov, E.B. Ten.** Study of brass LAF 94-0,5-0,15 casing properties.

Research object is the brass LAF 94-0,5-0,15, which as simulator of gold ZISrM583-80 use for making of jewelry and artistic articles by plastic deformation method. As casing alloy that brass not are use, therefore it casting properties are not study. At work researched the fluidity and fillability of it alloy. For

that used accordingly the known the spiral sample and newly developed petal-shaped sample with four petal of 100 mm in length, 25 mm in width and 2.5, 5, 10 and 20 mm in thickness. According to experimental dates at pouring temperature 1160 °C the brass fluidity on spiral sample composed 300 mm. In this case it fillability, which appraised at the petal-shaped sample, showed that all petals with thickness from 2.5 up to 20 mm are fill up in full with accurate reproduction of borders. The received results is indicate about that the brass LAF 84-05-015 have the good casting properties and therefore must be used for making by casting method the articles of jewelry and artistic application.

Keywords: goldlike alloy, brass LAF 94-0,5-0,15, casting properties, fluidity and fillability.

6. **E.B. Ten, E.Yu. Liholobov.** Factors of the steel 110G13L quality increasing during the out-furnace treatment by (Fe-Si-Al + Ti) complex instead (Al + Ti) complex.

There are presented the research result about of factors the improving the quality of steel 110G13L during the out-off furnace processing by complex (Fe-Si-Al + Ti) instead (Al + Ti) complex. Under consideration effect are appeared at significant increase the rates of mechanical properties — tensile strength σ_B — by 14 %, specific elongation δ_5 — by 55 % and impact strength KCU — by 12 %. It is showed, the received positive effect is the result of more high powerful deoxidizing and modifying action the (Fe-Si-Al + Ti) complex on the steel melt in comparison with (Al + Ti) complex. The confirmation of that is the 1,5 times lower Oxygen content (0,0014 % instead 0,0021 %) at steel, which treated by complex (Fe-Si-Al + Ti), and the 1,3 times more low Oxygen activity ($2,9 \cdot 10^{-4}$ % instead $3,8 \cdot 10^{-4}$ %). In this case are decrease of austenite grain size at the casted and thermal treated condition (4—6 point instead 3—4 point). The deoxidization action growth during the using of Fe-Si-Al instead Al it is cause so, as with the assistance of Silicon at process the deoxidization power is increase. The raising of steel deoxidization depth is decrease of the Titanium quota, which blocked by Oxigen, and increase the it quota, which use up for forming of nitride TiN, fulfilled the role of austenite crystallization centers. It cause the increasing of modifying effect during out-off furnace processing by (Fe-Si-Al + Ti) complex instead (Al + Ti) complex.

Keywords: steel 110G13L, out-off furnace deoxidization and modifying, aluminum, ferrosilicoaluminum and titanium, mechanical properties and structure dispersing, content and activity of oxygen.

7. **V. A. Smolko.** Kinetics of polymorphic transformations of quartz in synthetic sand mixtures upon heating.

The article is devoted to research into kinetic transformation of quartz in synthetic sandy compounds. Micro chemical analysis superficial tapes of sand quartz particles is presents. The dependences of cristobalite on descent, grain size, fractal dimension, time and temperature were obtained.

Keywords: quartz sandy, kinetic study of quartz phase transitions.

INFORMATION

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

1. **A.G. Panov.** Scientific and technical conference «Science and technologies of cast iron modifying».

2. **V.D. Belov.** X International Scientific and Practical conference «Progressive foundry technologies».
3. **V.A. Ivanova.** I-st All-Russian scientific-practical conference «Technical regulation, metrological support and quality management in coke production».
4. **Klimenko Stepan Ivanovich** (to the 60th birthday)
5. Index of articles published in the journal «Russian Foundryman» in 2020