

1. **Semenov V.** Proposed the original scientific basis of the crystal structure of primary education during the solidification of cast alloys

Formation of the desired crystal-line structure of the alloy in the casting is regarded as a manifestation of the principle of «order through the accumulation of latent (hidden) free energy.»

Key words: alloy, the structure of the phase transformation, the phase variable, non-equilibrium, irreversibility, the path of development, the external environment.

2. **Kechin V.A.** Staffing support of technological development of industrial enterprises.

The importance of advanced level tuition of engineers for development of industrial enterprises is shown. Characteristics of technological multistructurality of Russian economy and ways to accelerate the country's transition to a higher technological mode are given. Importance of integration of educational institutions and industrial enterprises in matters of advanced practice-oriented tuition of engineering personnel is noted.

Key words: engineering personnel, technological structure, integration, universities and employers.

3. **Nikitin V., Akichin S., Nikitin K., Zubova I., Vashlamov G.** Improving the quality of the alloy AK9ch aerospace

Presents the analysis of changes of chemical composition and mechanical properties of the alloy AK9ch for the period 1950-2015 it is Shown that at constant chemical composition mechanical properties of the alloy can be significantly improved through the use of special methods of preparation and processing of the melt. In the framework of the technological audit conducted the study, allowing to identify effective methods of technology of genetic engineering. It is shown that the use of microcrystalline alloys containing Ti and Sc can replace triple modifier and to improve the quality of the alloy.

Key words: alloy AK9ch, chemical composition and mechanical properties, technological audit, microcrystalline ligatures AlTi4 and AlSc2, the adjustment GOST 1583.

4. **Vdovin K., Feoktistov N., Gorlenko D., Hrenov I., Derabin D.** Studying the effect of cooling rate on the mechanical and exploitation - insulating properties of steel 110G13L

The article presents the research results of the coefficient of wear resistance and hardness manganese steel in molten state, depending on the cooling rate of the steel in the mold.

Key words: manganese steel, wear resistance, hardness, carbides, grain size.

5. **Diachkov V., Sokolov A., Nikitin K., Barinov A., Shabalova E.** Investigation of technological properties of model compounds for investment casting.

The effect of ambient temperature on the change in the linear dimensions of model compositions for casting were investigated.

Key words: casting, investment casting, model compounds, the linear expansion and shrinkage of the model compounds

6. **Diachkov V., Nikitin K., Barinov A.** Technology of preparation of ceramic forms to pour in for investment casting.

Developed technology manufacturing of shell forms in investment casting process allowing to exclude formation of cracks in shell forms when carrying out operation of smelting of wax models.

Key words: investment casting, melted quartz, extension of wax model, cracking of shell forms, steam autoclave.

7. **Karpenko D., Savchuk D.** The compactibility of dry quartz sand depending on the size of fraction at various ways of sealing

The experimental investigation of compression ratio and eventual porosity dependence on particle size and compaction way was performed for dry silica sand. Particularly three compaction ways was considered is vi-brocompaction, compaction by ram engine and pressing. Porosity value is agreement with common knowledge and empirical vibrocompactibility results for different sand fractions is most recent scientific knowledge.

Key words: lost-foam casting, grain-size analysis, silica sand, compression ratio, vibrocompactibility.

8. **Ozerova E., Savokhina O., Morozov V., Kutsaya A.** The fri-ability of resin bonded sand for rapid casting technology using S-max 3D printer

The work presents results of studies concerning friabil-ity of 3D light cured sand for rapid casting technology used for ExOne S-max printer. The friability of 3D light cured sand was measured by two diffent methods. Re-sulting friability was compared with friability of resin bonded sand.

Key words: Resin bonded sand, 3D light cured sand, fria-bility, 3D printers, 3D printed sand moulds

9. **Budanov E.** Modern experience of modernization of cast-ing production based on V-process technology

The article deals with development of the V-Process technology, a wide spread of most various types of cast-ings and alloys at the foundries of the world. The main efficiency indicators of the advanced US foundries are given. Effective engineering by the analysis of experience of world leaders of production of castings is shown.

Key words: production of vacuum castings, efficiency in-dicators, modernization of foundry production, import substitution and export of high-quality castings.