1. **V.A. Korovin, S.V. Plokhov, P.A. Kusov, A.S. Romanov.** A study of technical effi ciency of refi ning and modifi cation of the melt of grey cast iron disperse mixture of carbonates of calcium, arium, strontium, sodium.

Experimental studies of the refining-modifying effect in the treatment of iron melt with carbonates of elements such as potassium, barium, strontium, sodium. Their positive effect on the microstructure and mechanical properties of the alloy was revealed. The use of these chemical compounds in mixtures used for purification and modification of the alloy is confirmed by thermodynamic calculations. The composition of the proposed complex mixtures is selected experimentally using optimization methods. The effectiveness of selected complex mixtures based on carbonates has been successfully tested.

Keywords: the melt of cast iron, refinement, modifying, carbonates, furnace charge, microstructure, mechanical property, ecology.

2. **E.Y. Karpova, E.Y. Romanova, A.V. Romaniuk,E.N. Radkevich.** Deformation behavior of forming mixtures depending on their properties.

The paper presents the results of studies of the ability of the molding mixture to deform depending on its humidity at a constant speed of application of the load, the time of action and the speed of its change.

Keywords: molding mixture, rheological properties, loading speed.

3. **G.S. Mirzoyan, A.M. Volodin, N.P. Petrov, S.M. Horikov, I.I. Lyashkov.** Optimization of physical-mechanical properties of metal of centrifugal cast when producing weldless tubes with big diameter for power engineering industry.

The paper presents the possibility of high- tech production of weldless tubes with big diameter (≥500 mm) from 16GS steel for NPP facilities with the use of pig hollow centrifugal casts instead of full cast bar succeeded by large deformation at a hydrolic press with 2500 t load in four-backups forged facility providing fine-grained structure of metal with high mechanical properties and relative forging grade 1,5—2,0.

Keywords: tube, centrifugal cast, hollow cast, forging grade, forged facility.

4. **Yu.N. Loginov, S.I. Stepanov, N.M. Ryshkov, A.V. Yudin.** Th e eff ect of energy density on the properties of titanium preparation obtained by a selective laser melting method.

3D printing, which is realized in layer-by-layer mode, i.e. additive metal fusion is known as one of the modern technical solutions in producing semi products and parts, especially of complex configuration. The purpose of the study is to investigate the effect of laser melting parameters on the properties of the resulting product. The characterization of powder for printing is provided. Samples for the study of the physical and mechanical properties of the material were produced on a layer-by-layer deposition MeltMaster3D-550 machine using the selective laser melting method manufactured by CNIITMASH. Cylindrical billets with a building direction orthogonal to the longitudinal axis were obtained by an additive method and tensile test specimens were made from them. It was revealed that with a lower laser scanning speed the higher values of strength were achieved. It was found that the HRB hardness is higher with higher laser power. The hardness was found to be inversely proportional to the energy density. The density function of the material depending on the energy density has a maximum, which corresponded to the high strength.

Keywords: additive manufacturing, selective laser melting, 3D printing of products, strength, density, energy density.

5. **M.A. Ioff e, R.D. Farisov.** About the reserves of eff ectiveness increase of foundry operations from the position of synergetics.

Foundry operation is considered from the position of synergetics, where directly cooperate the smelter workshop, molding shop, rod workshop, thermo fettling workshop, repair service workshop and technological departments as a single system. Synergy of the foundry operation is the interaction of all operations aimed at the production of high-quality casting with a high productivity. To understand the role of synergetics in the foundry operation, examples are given where the real results of efficiency are obtained.

Keywords: synergetics, foundry operation, productivity, quality of castings, lean production.

6. **A. Popov.** Experience of Laempe, Germany by production of castings «ventilated brake disks».

The article deals with best practices of the leading manufacturers of the ventilated brake disks worldwide on the basis of the core-making equipment Laempe for Coldbox-Amin process. Technical characteristics of the core-making machines for production of cores of brake disks are also given.

Keywords: cast automotive parts, import substitution, ventilated brake discs, core-making equipment, Coldbox-Amin-process.