

1. **V.I. Verbitsky.** Intensity and efficiency of air pulse molding.

A comparative study of models of processes simulating the operation of 3 pneumatic-impulse molding systems (PFS) — Seiatsu, Airpress-plus and Impact. For the first time, accelerations of the motion of the mixture layers and the rate of their deformation were obtained. It has been established that the simplest solution — the intensification of air pulse processes does not lead to a corresponding increase in the quality of compaction and the efficiency of the molding machines. The processes are distinguished by high dynamism and complexity, optimization of the PFMS parameters is possible only on the basis of higher analysis and computer simulation.

Keywords: pulse system, computer simulation, pressure, front steepness, mixture density.

2. **V.A. Yudin.** On the issue of import substitution of materials for 3D-printing of foundry sand-polymer forms.

The article is dedicated to the problem of the alternative quartz sand for powder-binder-jetting process. According the analysis of the properties original quartz sand and of the basic knowledge furan process, the main requirements of quartz sand are identified. The different type of the quartz sand are tested. As result, the type of the quartz sand, which produced in Russian Federation, is defined and is used in foundry.

Keywords: powder-binder-jetting, sand form, quartz sand, furan process.

3. **P.L. Satre, C.A. Essman.** Reducing Heat Loss through Refractory Design

When considering the components of a refractory system for lining the equipment used in melting, holding, transferring, and pouring molten metal, several factors should be considered. These factors include the durability of the lining material, the ease of installation, and the actual cost of the refractory. The total cost should also include consideration of the heat loss, a measure of continual energy consumption. While completely eliminating heat loss through the refractory lining from the melting process is impossible, the thoughtful consideration of material selection, lining dimensions, and most importantly the selection and placement of insulation materials within the refractory system can significantly impact heat loss. This paper documents and compares the heat loss factors of common refractories and insulation materials available for foundry applications. Case studies comparing the original and the modified heat loss results are shown to demonstrate the dramatic differences that proper lining design can have on reducing energy consumption.

Keywords: melting, energy, ladles, heat loss, process improvements.

4. **Y.N. Loginov, S.I. Stepanov, V.A. Dub, I.A. Raschetnikova.** Quality of thin elements of titanium cellular structures obtained by the selective laser melting method

The results of experiments on the use of additive 3D printing technology by the method of selective laser melting for the manufacture of cellular structures for medical purposes are presented. With the help of electron microscopy, the architecture of the cellular material was revealed, and the geometrical parameters

of the structure were measured. It is shown that increasing the radiation power when using selective laser melting leads to an increase in the density of the material, an excess of radiation power can lead to a violation of the product geometry, which should be avoided when making complex structural compositions.

Keywords: additive technologies, selective laser melting, 3D-printing, titanium powder, cellular structures, medical implants.

5. E.A. Usoltsev, E.L. Furman, I.E. Furman, S.N. Zlygostev. Development of technology for the manufacture of valve pairs SHGN by investment casting method.

This article discusses the issue of obtaining cast billets for valve pairs of sucker-rod downhole pumps, and also describes the technology for producing them using the method of casting using investment casting.

Keywords: precision casting, investment casting, sucker rod pump valve pair, cobalt satellite, ball, seat.

6. I.Mel'nikov. Core technologies of Laempe at foundries of Chinese automobile concern «Dongfeng Motor».

The article deals with successful experience of casting production of automotive parts by the example of Dongfeng company from China, and shows analysis of this producer as a most effective car producer worldwide.

Keywords: automotive components, Al castings, cylinder head, core-making machines, foundry equipment in China, Coldbox-Amin and BeachBox technologies.

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