Methodology. The investigations were carried out on Al-Cu alloy samples with copper content 25,0 -36,0% (mass.), the rest is aluminum. The melting of samples was carried out in a Taman furnace at temperatures of 820-1100 K with a graphite heater in alund crucibles. Cooling rate of alloys was 10 K/s. Part of the samples were made using the same method, but after heating poured into wedge shapes, at the expense of which when cooled in the wide part of the wedge the cooling rate was obtained 102 K/s, and in the thin part 104 K/s. In the work we use differential thermal, metallographic, chemical and X-ray spectroscopic analyses.

Findings. The effect of overheating of the melt and cooling rate of alloys of the Al-Cu system with a copper content of 25.0-36.0% (mass.), the rest of the aluminum is investigated. It is shown that an overheating of the liquid at 50-100 K above the liquid-liquid line leads to the formation of a fine-dispersed eutectic structure and the inhibition of the formation of primary aluminum crystals in the pre-evacuation of alloys and the Al2Cu phase in hypereuvtectic alloys, in accordance.

An increase in the melt overheating temperature by 150 K above the liquid-liquid line and the subsequent cooling at 103-104 K/s leads to the complete inhibition of the formation of primary crystals.

An overheating of the melt on 100-150 K alloys above the liquid line and subsequent cooling with a velocity of 103-104 K /s reduces the rate of corrosion by 30-45% and increases the numerical value in 1,3-1,45 times the relative wear resistance, and the brittleness of alloys decreases in 1,2-1,35 times in comparison with the samples after casting.

Keywords: melt, overheating of the alloy above the liquidus line, Al-Cu alloy, Al2Cu phase, eutectic

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ELASTIC-DISSIPATIVE STABILIZATION OF DYNAMIC PROCESSES OF HYDROPULSE SYSTEMS OF MINING MACHINES

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Purpose. Investigation of elastic-dissipative stabilization of dynamic processes of hydropulse systems of mining machines.

Methodology. The studies were carried out through analyzing effective elastic-dissipative connections of elements of structures. Parameters are calculated by methods of finite and differential differences with conducting of experimental researches.

Findings. The results of investigations of the dynamic processes of the functioning of the hydropulse system and means of reducing the impact on the base machine that are given in the article. Effective elastic-dissipative connections of elements of structures that influence the stabilization of dynamic processes are offered. Their parameters are calculated by methods of finite and differential differences with conducting of experimental researches. Connections: the waveguide reduces the dynamic factor by 25 ... 30%; heterogeneous lyophobic system, which provides an increase in the decrement of the damping vibrations of 1,4 ... 1,95.

Keywords: stabilization, stiffness, dissipation, hydraulic hammer, waveguide, heterogeneous lyophobic system

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THEORETICAL INVESTIGATIONS OF THE STRESSED STATE ON THE EXCHANGE RATE OF MATRIX AT HIGHLY CYLINDER PARTS

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Purpose. investigations of the stressed state on the exchange rate of matrix at highly cylinder parts.

Methodology. The studies were carried out through mathematical modeling of the change of stresses at extraction on a void surface of a matrix and used for more accurate description of their distribution in comparison with existing dependencies.

Findings. The paper presents the results of theoretical studies on the distribution of components of the stress tensor on the extractor rib of the matrix during the extraction without the clamping of the cylindrical part. Such studies should more fully disclose the laws of stress distribution and deformation during plastic deformation in order to obtain formal connections between the parameters of the process and their impact on the quality of the final product. A mathematical model of the change of stresses at extraction on a void surface of a matrix is obtained, which more accurately describes their distribution in comparison with existing dependencies

Keywords: extract; blank; meridian voltage; extracting edge of the matrix