

1. **M.N. Saubanov, M.V. Iksanov, N.F. Molchanova, I.O. Leushin.** Evaluation of the operability of castings made of cast titanium alloy based on the results of model tests

**Annotation.** The paper presents the results of experimental studies of the operability of cast and cast-welded models made of cast titanium alloy type TL3 with structural and technological stress concentrators under static and re-static loading. The actual values of limit loads and conditional stresses have been experimentally determined depending on the hydraulic pressure. The results obtained allow us to evaluate the stresses arising from internal hydraulic pressure in various elements, including in the most stressed areas, ship fittings and pumps, and recommend the level of loads to ensure a safe maintenance of ship equipment.

**Keywords:** model, casting, static and re-static internal pressure, stress concentration factor, ultimate breaking load.

2. **A.D. Podolchuk.** The use of silicon carbide materials in the smelting of iron-carbon alloys in modern conditions

**Annotation.** The technology of alloying silicon and carbon molten iron with carbon-silicon carbide materials with the effect of preliminary graphitizing modification of the melt.

**Keywords:** carbon-silicon carbide materials, C-Si mixtures/briquette, carbon-silicon carbide mix/briquette, cast irons, silicon carbide, synthetic iron, gray cast iron with plate graphite, high-strength iron with spheroidal graphite, graphitizing inoculation effect, crystallization centres of graphite in iron melt, eutectic super cooling during crystallization of cast iron, improved graphitizing properties of cast iron.

3. **A.N. Poddubny.** Technological issues of manufacturing critical castings for the nuclear industry from ferritic cast iron with spherical graphite

**Annotation.** The article describes technological solutions for casting blanks for containers for transportation of nuclear waste. As examples, calculations of external refrigerators are proposed to solve the issues of directional crystallization of the casting. Calculation of optimization of shrinkage processes is given. Specifically, the actual example shows a picture of the effect of shrinkage during the casting and cooling of the workpiece on the quality and density of the resulting casting material.

**Keywords:** ferritic cast iron with spherical graphite, crystallization of casting, shrinkage.

4. **Yu.N. Loginov, E.D. Stepanova, G.V. Muller-Kamskii, S.I. Stepanov.** Implant for osteotomy manufactured using laser powder bed fusion of grade 1 titanium

**Abstract.** Literature analysis revealed the necessity to manufacture implants in the form of prisms with a triangular base. A prism of the required design with a lattice structure was manufactured using selective laser melting. A tendency to destruction of the thin edge of the cellular implant was discovered. An improved porous implant structure based on intersecting channels has been proposed.

**Keywords:** additive manufacturing, laser powder bed fusion, 3D printing, implants.

5. **V.I. Chechukha, M.A. Sadokha.** Gas sinks and porosity high pressure casting and measures warnings for their formation

**Annotation.** This paper describes the most common defects in high-pressure casting — gas holes and gas porosity. The factors influencing their formation have been identified. Additional effective measures

to reduce the defectiveness of castings for these defects are also considered, which are advisable to use to obtain critical and especially critical castings with high requirements for the surface after machining.

**Keywords:** high pressure casting, casting, aluminum alloy, critical castings, casting defect, gas defects, classification of defects.