1. **V.D. Belov, A.Y. Kachalov, S.P. Pavlinich,P.V. Alikin.**Investigating the influence of casting parameterson the surface roughness of the large titaniumalloy VT20L casting produced by wax pattern-freetechnology.

Investigated the surface roughness of the titanium alloy (VT20L)casting produced by wax pattern-free casting technology in theevacuated graphite mold. Parts of casting mold were made of twograde of low ash graphite by CNC-milling. Cutting parameters fordifferent cutting tools were based on manufacturers recommendations.To measure the surface roughness the MarSurf M 300Ccontact profilometer was used. The surface roughness was from Ra1,34 to 3,46 mm. The results of this study indicate that roughness ofthe casting surface decreases with increasing quantity of the metalpassed through the mold cavity, and thereby much closer contactbetween metal and mold surfaces.

Key words: surface roughness, pattern-free technology, graphitemold.

2. **V.A. Grachev.**Thermodynamic characteristics of interactionof phases during metlting of cast iron undertemperature fluctuations.

The article represents a thermodynamic analysis of phase interactionduring cast iron melting in cupola and electric furnaces infoundry. It reveals the influence of temperature fluctuation on theinteraction of the metal with the gas phase, slag, and carbonic solidmaterials. Based on the research, a fundamentally new design ofgas cupola furnace with heterogeneous fi re-resistant bed charge hasbeen developed, patented and introduced.

Key words: Gas cupola, slag, coke.

3. **V.E. Bajenov, A.V. Fadeev, C.C. Aseeva,A.V. Koltygin, V.D. Belov.**Deteriminig the dimention deviations of VT20Ltitanium alloy castings produced by waxpattern-free casting technology.

We describe specialty of thin-dimensional titanium alloy castingsmanufacturing using wax pattern-free casting technology. Castingswere obtained in CNC-milled graphite molds made of low ashgraphite. Measurements result corresponds to accuracy class 6 (byRussian standards GOST), implies size deviation less than 1,5 mmon the 1200 mm diameter. These results are valid for castings obtainedusing sufficiently flexible cores. Measuring of a castings wascarried out using industrial optical 3D scanner ATOS II XL 400.Control of casting's geometry was performed by comparison betweenthe initial STL — model of the casting and points cloud, theresult of 3D scanning. Outer surfaces of casting should be upscaledby 0,7—0,8 %, inner — by 0,2—0,3 % when designing a castingmold. These differences can be explained by the difficulty of linearshrinkage when using nonflexible cores. Described method has signifycant advantages over lost-wax casting method for produce largetitanium castings.

Key words: wax pattern-free casting technology, CNC-milledgraphite casting mold, titanium casting, non contact measurementmethods, ATOS II XL 400.

4. **A.V. Fadeev, V.D. Belov.**The experience of manufacturing a large castingfrom titanium alloys.

Currently in Russia is conducted intensive work on the on the industrialevelopment of a new generation aircraft engine PD14. Inthe engine design used a lot of advanced technological solutions. Inparticular, used large thin-walled castings of titanium alloys. Thiswork focuses on some aspects of their manufacturing in productionconditions of Russian company «UMPO».

Key words: titanium alloys casting, graphite mold, PD14, vacuummelting.

5. **Yu. Abakumov, A .V. Kozlov, R.F. Yusipov.**Techniqu e of increasing wear-resistingcast iron chill mould casting methodof inoculation.

Study on the inoculation held cast iron ferroceriem FCM-5 for gettingDUCTILE IRON with pearlitic structure. It has been shownthat chill castings with spherical form of graphite with pearliticstructure have higher wear resistance compared with gray cast ironwith lamellar graphite form.

Key words: iron-carbon alloys, cobalt, magnesium, modifi cation,graphite inclusion, durability, metal matrix.

6. **O.V. Sotsenko S.Y. Afonin.**Experience in 3D computer reconstructionof graohite inclusions form in castiings madeof heavy duty cast iron.

Method of three-dimensional stereological reconstruction of graphiteinclusions in heavy duty cast iron using SolidWorks software isproposed. It is shown, that reconstructed compact and aggregatedgraphite inclusions give a more complete picture of their real form,than random cross-section by grinding plane.

Key words: heavy duty cast iron, globular graphite, stereological reconstruction.

7. **G. I. Degtyarenko**. Simulation of green sand moldingmixture circulation process.Mixture composition management.Theend. Startat # 6-2016 G.