

Contents of «Russian Foundry» magazine No.11 2019

1. V.A. Kechin. Development of an engineer training system for foundry.

The article discusses the features of training specialists in foundry according to the programs of level training of enlarged groups, the system of formation of regulatory materials and methodological support.

Keywords: level training, regulatory materials, standards.

2. I.A. Shlyaptseva, I.A. Petrov, A.P. Ryakhovsky, V.S. Moiseev. Research of aluminothermic restoration of titanium dioxide in aluminum melt.

The authors investigated the possibility of reducing titanium from titanium dioxide in an aluminum melt. The result is achieved through the joint use of titanium dioxide with fluorides of alkali and alkaline earth metals. Thermodynamic calculations of the chemical reactions of the interaction of titanium dioxide with aluminum and fluorides are carried out. It has been experimentally confirmed that, upon reduction of titanium and its transition to an aluminum melt, a modifying effect is exerted on the aluminum structure. The research results can be used in the development of new modifying fluxes for aluminum alloys.

Keywords: titanium dioxide, fluorides, thermodynamic calculations, modification, macrostructure.

3. Hosen Ri, N.A. Slavinskaya. Modification of casting aluminum alloy AM4.5Cd (VAL10) scandium.

At the first stage of the study the structural components of scandium ligature (2,0 wt. % Sc) consisting of 73,64 at. % Al and 26,34 at. % Sc: ($Al_{73,64}Sc_{26,34} = Al_{2,8}Sc \approx Al_3Sc$) and metal base from Al + eutectic (Al + Al_3Sc); at. %: 99,67 Al and 0,33 Sc have been identified. Scandium aluminide particles possess a compact quadrangle shape and are evenly distributed in the matrix. The effect of scandium addition on structure formation, liquation processes and properties of the AM4.5Cd alloy have been studied. Microstructural analysis of scandium alloys under a raster microscope in reflected electrons and under an optical microscope showed that an increase in the addition of scandium contributes to the refinement of the structural components — α -solid solution and eutectic. The regularities of changes in the composition of α -solid solution and eutectic of different composition and origin, as well as their microhardness depending on the amount of scandium addition have been established. The modified eutectic crystallizes with the addition of 0,1 wt. % Sc.

Keywords: aluminides, microhardness, nanohardness, α -solid solution, eutectic, structural components, element content, modification

4. D.A. Boldyrev, L.I. Popo, S.G. Prasolov, S.V. Davydov. On the qualitative identification of nodular and vermicular graphite cast iron.

In this article, an attempt is made to actually identify the brand of high-strength cast iron with spherical and vermicular graphite VCH40 (GOST 7293—85) — at the content of spherical/vermicular graphite (40—80%)/ (60—20%) with respect to existing types and brands of structural cast iron — with vermicular graphite, malleable with flake graphite and high-strength with spherical graphite. It is shown that according to the strength properties (time resistance, hardness) actually obtained as a result of the research, this grade at an average ratio of spherical/vermicular graphite of 50/50% corresponds to

ductile iron, but is somewhat inferior to it in plasticity (guaranteed elongation of 2% instead of 3—4%). Full compliance of the VCH40 grade with spherical and vermicular graphite to ductile iron can be achieved at their ratio (60—80)/(40—20)%, respectively.

Keywords: high-strength cast iron, ductile iron, cast iron with vermicular graphite, spherical graphite, flake graphite.

5. **V.A. Kukartsev, I.A. Kaposhko., A.V. Kukartsev. Developing of baking graph of induction furnace lining, supporting its life.**

Smelting equipment is the base component of key assets of casthouse production, so, firstly it needs on continuous reproduction. It is furnished on the backs of timely and qualitative service and repair, composing 8—12%. Techno-economic condition of enterprise depends on this processes as far as workforce productivity of production workers closely coupled with technical conditions of equipment, working capacity and for the reasons its dead time. It's impossible to produce high quality products and to get maximal profit from investing capital without timely repair and equipment service. Change of incused lining coupon takes the part of the main role in reproduction supporting of melting furnace. The quality of technological process of production and lining baking influents on its persistence and effectiveness of smelting equipment working. The lining baking graph which depends on furnace capacity, degree of solidity of ingoing furnace burden, using kind of lining and smelted alloy uses for control of operation of lining baking.

Keywords: induction furnace, lining, key assets, baking graph, lining life, incused lining coupon.

6. **Yu.A. Svinoroev, K.A. Batyshev, Yu.I. Gutko, K.G. Semenov. Purging methods for manufacturing casting cores in mixtures with technical lignosulfonates.**

Investigated the possibility of using as a binder technical lignosulfonate for the manufacture of blow-off methods small cores in the production of shaped cast-iron casting. The development is aimed at the replacement of a dominant in foundries at the present time, Cold-Box Amin process as environmentally hazardous, expensive and operating on the imported binder and materials. It is shown that the advantage of lignin materials is their safety, manifested both in the workplace, directly in the foundry, and in ensuring environmental cleanliness in the area of the enterprise with such production. It is indicated that when switching to the proposed lignin materials, the price of binders can be reduced by two orders of magnitude (from 375 rubles per kg to several tens of rubles, taking into account the modification). Special attention is paid to the need to develop specialized equipment focused on lignin binders.

Keywords: foundry core, technical lignosulphonates, Cold-BoxAmin process, binding capacity, core sand, passanonymoustoken mixture, purging methods, technological equipment of the process.

Visit Plants «GUANGDONG FENGHUA ZHUOLI TECHNOLOGY CO., LTD»

A delegation of Russian specialists visited the FHZL Co Ltd factory (China) on October 7 2019, consisting of: I. Dibrov, President of the Russian Foundry Association, O.V. Krapivina, Deputy Chief Metallurgist, OAO "Kazancompressormash", S. Farafonov, Deputy General Director for Marketing, Spetslit LLC, AM Embulaev, Director of the NGO 3D Integration.

The delegation and managers of the plant are presented in fig. 1.

Factory FHZL Co Ltd. located in the city Foshan, Guangdong Province, Industrial center of China.

FHZL is one of the first technology research factories 3D Printing for foundry. When, Professor Yang Yunnian developed PCM Patternless Casting Manufacturing technology - foundry without (model) sand molds, the plant received active support from government funds in China, and over 20 years of research received over 100 unique patents own developments, including own software and own materials, creating an industry standard.

Now this technology is used by BAF, GreatWall, Chaery, Lifan, Hamma, JAC and about 60 engineering corporations, and the number of installed 3D printers exceeding 300 units including Russia and India

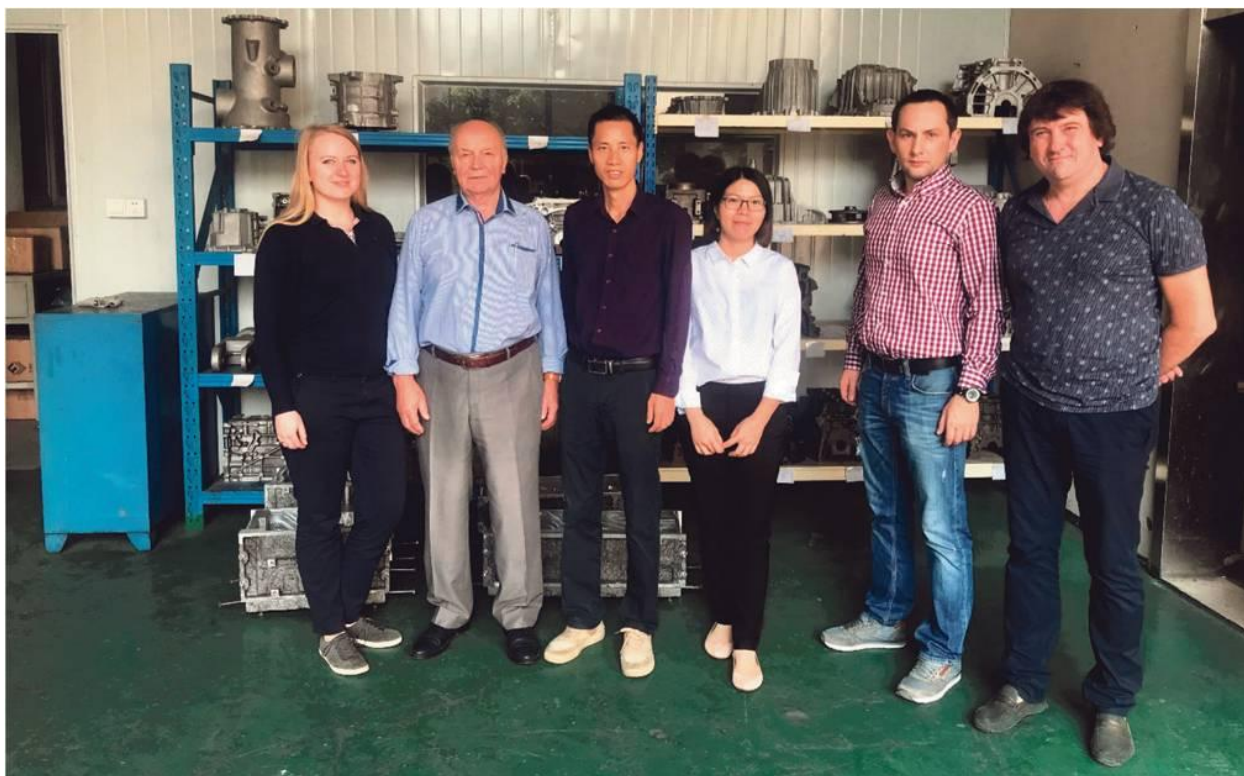


Fig. 1. (from left to right) Krapivina O.V., Dibrov I.A., Wang Jun Yeng - general director of the enterprise, Paris Cheng - sales representative for export, Yembulaev A.M., Farafonov S.V.

Symposium Italian equipment and foundry materials

On October 29, 2019, a symposium on foundry equipment and materials for foundry was held in Moscow. The organizers of this event were ICHE-Embassy of Italy Trade Exchange Development Division and the Association of Italian Foundry Manufacturers AMAFOND equipment with the involvement of the Russian Foundry Association. Director greeted AMAFOND Association Fabrizio Carmanini and President Russian Foundry Association Dibrov I.A. 11 companies made promotional materials. The symposium was attended by 78 specialists from Russia and Italy.

Speakers of Italian firms and co-rapporteurs of company representatives in Russia are presented in the photograph.

