FOUNDRYMEN o f R U S S I A **№ 7/2018**

Contents

Based on the experimental data obtained in the temperature range 500—1000 °C, the forecast of the heat capacity, thermal conductivity and thermal diffusivity for the temperature range from 20 °C to the melting temperature of cast iron СНУ22Ш 1260 °C is made. The experimental data were described by empirical linear equations: Cq,T = 0.092•T + 492.0 J/(kg•K); λh,T = 0.0058•T + 9.623 (W/(m•K) and *ac*,T•106 = 0.0011•T + 3.419 (m2/s).These thermophysical properties of cast iron 20 °C to the melting point of 1260 °C. In this temperature range, the specific heat of the pig iron increases by a factor of 1.23 — from 493.8 to 607.9 J/(kg•K), the thermal conductivity increases by 1.74 times from 9.74 to 16.93 W/(m•K)), and the thermal diffusivity is 1.4 times (from 3.44•106 to 4.81•106 m2/s).

Key words: high-alloyed aluminum cast iron, spherical graphite, temperature, heat capacity, thermal conductivity, thermal diffusivity.

The article considers the strength of molds and cores, as the characteristic of which is offered to use the indicator of working capacity. The expressions for determining the indicator of working capacity *Rb* of molds and cores made from synthetic sand mixtures taking into account fractal dimension of the aggregate mixture (*Fr*), the coefficient of heterogeneity of the strength of the mixture (*m*) in different parts of molds (cores) and parameter Grneisen *GrL* are received. It is found that the indicator of working capacity should be within *Rb* 1,5—3,0 depending on the design and shape of molds and cores. It will provide production of molds and cores and prevent their destruction during transportation and will guarantee high-quality castings. Developed method of estimation of service properties of molds and cores considering fractal dimension, anharmonicity and heterogeneity of the strength characteristics of the mixtures allows setting the indicator of working capacity as construction at the stage of engineering design, process design shaping and filling.

Key words: strength, molding mixtures, working capacity of molds and cores.

The properties of technical lignosulfonates in aspects of their physical and chemical nature, Genesis, production, and application are considered. It is offered to consider them as initial raw materials for development of new, modern binding materials. Examples of successful implementation of lignosulfonate binders for foundry production are given.

Key words: technical lignosulfonates (LST), foundry binders, modern level of properties, LST aspects, strength characteristics of binders.

The article is devoted to the description of the perspective control system of the foundry machinery. The concept of information flows with the post-industrial organization of production is described. A

possible list of workshop services and their integration on the basis of a local computer network are provided.

Key words: Automation, PDM environment, CALStechnologies,foundry, post-industrial production.

5. **Y.F. Voronin.** Accelerated option eliminate defects in castings.

The article describes the reasons for the formation of hot cracks in castings of cast iron and steel and offered technological routes accelerated their elimination.

Key words: Hot cracks, defects, technological routes.

6. **G.S. Makarov.** Evolution of Aluminium Alloys Melting.

Evolution of melting techniques for aluminum alloys in the last 100 years is described, as is the competition between flame and electric melting in achieving better performance in furnace productivity, melt loss, energy saving and metal quality. To analyze the logic of development, the concept of Hegel's evolutionary spiral is used. It is shown that the completion of the third coil of the spiral in the 21st century will be the melting of aluminum alloys. It will combine high specific power of plasma with a variety of modern flame furnaces, providing energy saving, ecological compatibility of the melting process, minimal metal losses and the highest level of metal quality.

Key words: flame melting, electric melting, flame hearth,reverberatory electric furnace, flame hearth furnace, channel induction furnace, coreless induction furnace, electromagnetic stirring, electromagnetic pump, shaft furnace, multi-chamber furnace, rotary tiltable furnace, direct-current arc furnace, plasma furnace.

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Trip to Turkey for the International Exhibition

Conference "Import substitution and development of exports of cast products from aluminum alloys"