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ISSN 0132-0890

ЧЕРНЫЕ МЕТАЛЛЫ



Совместное издание · № 3 (975), 2013

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und
eisen

Ежемесячный научно-технический и производственный журнал
по актуальным проблемам металлургии и машиностроения

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Журнал «Черные металлы» по решению ВАК Министерства образования и науки РФ включен
в «Перечень ведущих рецензируемых научных журналов и изданий, в которых должны быть опубликованы
основные научные результаты диссертаций на соискание ученой степени доктора и кандидата наук» по металлургии

Founders

- "Ore and Metals" Publishing House
- National Research Technological University "Moscow Institute of Steel and Alloys"
- Magnitogorsk State Technical University named after G. I. Nosov

With participation of

- All-Russian Design and Research Institute of Metallurgical Machine-building (VNIIMETMASH)
- Byelorussian Steel Works — Management Company of "Byelorussian metallurgical Company" holding
- The State Hermitage museum

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Editorial Address

Actual address: Moscow, Leninsky prospekt 6/1, office 617
 Mailing address: 119049, Russia, Moscow, P.O. Box # 71
 Phone/fax: +7-499-236-11-86
 E-mail: chermet@rudmet.ru; tsurulnikov@rudmet.ru
 Internet: www.rudmet.com

Editorial Board

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Printed: "Roliiks" publishing house, 141006, Russia, Moscow region, Mytishchi, Olympiyskiy prospekt 30/17

Publisher: "Ore and Metals" publishing house
 Phone/fax: +7-495-638-45-18
 E-mail: rim@rudmet.ru

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<p>The most prospective development tendencies of construction of electric arc furnaces are observed based on data analysis from national and foreign literature and on the model of electric arc furnace developed by the authors. It is shown that extensive way of increase of productivity of electric arc furnaces has exhausted its possibilities and the new qualitative breakthrough in the development of electric arc furnaces can be achieved owing to specialization of construction of the furnace and improvement of the melting technology taking into account kind of used charge materials and ways of their charging.</p> <p><i>Key words: electric arc furnaces, charge materials, productivity, construction, chemical composition, steel scrap, transformer capacity, geometric parameters, electric furnace unit.</i></p>	
A. P. Kolikov, A. V. Kotelkin, A. D. Zvonkov, V. I. Gladkov, D. B. Matveev, Ya. A. Lakiza. Usage of X-ray diffractometry for investigation of residual stresses in components during cold metal forming	20
<p>Examples of efficiency of determination of residual stresses in billets and constructions of different usage at the stages of their manufacture and operation are presented using the new method of X-ray diffractometry. To realize this method in industrial conditions, the portable X-ray diffractometer has been developed. Its main technical parameters are presented.</p> <p><i>Key words: cold metal forming, plastic deformation, elastic deformation, X-ray diffractometry, residual stresses, surfacial strengthening, durability limit.</i></p>	

V. E. Gromov, Yu. F. Ivanov, V. B. Kosterev, O. Yu. Efimov, A. B. Yuryev, S. V. Konovalov.	
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The results of investigations of physical nature of thermomechanical strengthening of 09G2S steel (0.1% C, 1% Mn, 2% Si) for H-beam are presented. The quantitative regularities of structure, phase composition, defect substructure and mechanical properties formation in different H-beam cross sections under accelerated cooling in different regimes are established. It is shown that state of defect substructure of α -phase is determined by the mechanism of γ - α transformation, by conditions of high-temperature rolling and accelerated cooling and by distance to the surface of accelerated cooling.

Key words: steel, structure-phase state, dislocation substructure, gradient, strengthening mechanisms, thermomechanical processing, H-beams.

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Driven by worldwide population growth, the steel industry is confronted with a shortage of resources that will lead to considerable burdens due to rising energy and raw material prices. The increase in environmental burdens associated with the rise in population is reflected in rigid environmental policy measures that considerably increase the pressure. Steel companies can only react to these demands with continuous innovation, with the main development trends aiming at improving energy and resource efficiency, increasing competitiveness as well as improving efficiency, flexibility, quality and works logistics.

Key words: European steel industry, basic oxygen steelmaking, electric arc furnaces, continuous casting, slabs, blooms, billets, beam blanks.

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The present article shows the development of the electroslag remelting (ESR) production at BGH Freital, where the first German works using ESR technology is located since 1962. The six ESR plants are producing ingots up to 2 t ingot weight. A new ESR unit has been put into operation in August 2012 and permits remelting under protective inert gas atmosphere.

Key words: electroslag remelting, steelmaking, continuous casting, rolling, electrodes, stainless steels, heat-resistant steels, inert gas protective atmosphere.

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Vallourec & Mannesmann Tubes operates four GFM 4-hammer radial forging machines, two of which are used alongside the standard hot working processes for the manufacture of medium- and thick-walled pipes. The present article describes how V&M Tubes is achieving this and highlights the opportunities opened up by forging. Meantime, V&M Tubes is using radial forging technology at four locations. The process has been successfully further developed together with the plant manufacturer GFM and was patented in 2009. Premium Forged Pipe (PFP) is a worldwide registered trademark and is marketed under this name by V&M Tubes.

Key words: 4-hammer radial forging, seamless tubes, Premium Forged Pipe, FEM simulation, high-alloyed steels, pilot plant, flexibility.

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