

CONTENTS

Metalurgia International 7/2008

ISSN 1582 – 2214

SUSTAINABLE DEVELOPMENT5 –11	ANA JOSAN, LUCIA VÎLCEANU, PUȚAN VASILE, ANA SOCALICI: Researches concerning the particularities of the hypereutectoid steel, using for casting the mill rolls 33
VASILESCU DAN DRAGOS, VELICU STEFAN, DOBREA VIOREL, CORĂBIERU PETRICĂ, ANIȘOARA CORĂBIERU : Study of the mechanic-elastic and electric characteristics of the ecological quaternary alloys 5	BRANDUSA GHIBAN, SORIA CIUCĂ, IRINA CARCEANU, GHIBAN N., NEDELCU I.: Austenitic stainless steels corrosion properties modified by silicon alloying 39
CIUREA AUREL, BORDEI MARIAN: Considerations on the separation of the smoke particles through sonic agglomeration device 9	AGOP MARCEL, VIZUREANU PETRICĂ, IOANNOU P.D.: A theoretical approach of the quantum thermal conductance of electrons 43
MATERIALS SCIENCE RESEARCH AND DEVELOPMENT 12 - 62	CARCEA IOAN, ROMAN COSTEL, CHELARIU ROMEO, MIHAI DUMITRU, ȘTEFAN MIHAI: Experimental trial of the digital solidification simulation model 48
IOANA ADRIAN, NICOLAE AVRAM, BĂLESCU CEZAR: Elements of electric arc furnaces' management 12	CIOBANU IOAN, CRISAN AUREL, MUNTEANU SORIN: Ph. D. thesis in the field of cast iron, casting and solidification 55
CALEA GHEORGHE, CIOBANU EMIL, NICOLAE AVRAM, HAZEL MENADIL: Considerations viewing the metallic materials utilized in the turbine blades construction 16	MILOSAN IOAN: Study about the mathematical modeling's results of a nickel bainitic S.G. cast iron 59
NEDEFF VALENTIN, ZICHIL VALENTIN, CARMEN SAVIN, MĂCĂRESCU BOGDAN, MOȘNEGUȚU EMILIAN, MIRELA PANAINTE, AMBĂRUȘ ALEXANDRU: A new method to determinate the viscosity of the non-Newtonian mixtures 21	FINANCIAL ECONOMIC MANAGEMENT. ACCOUNTANCY IN METALLURGY..... 63 - 68
DANIELA FLORENTINA TĂRĂȚĂ, CEALÎCU DRAGOȘ: Research regarding the selection of steels grades for hot working (Part I) 27	MANOELA POPESCU: Considerations regarding the usage of NPL in elaborating business strategies 63
	OANA MIONEL: The economic foundation of the luxury Industry 67
	FOSECO Turbostop system – reference list..... I-II
	New books, published by Romanian Metallurgical Foundation.....III-IV

DATA BASES

E According to paragraph 2.6 of license agreement between EBSCO Publishing Inc. (U.S.A.) and FUNDAȚIA METALURGIA ROMÂNĂ (ROMANIA) the journals METALURGIA and METALURGIA INTERNATIONAL are included in EP Products, starting from July 1st, 2006.
E These journals are included on EBSCO's site: www.ebscohost.com, chapter „Computers and Applied Sciences Complete”, positions 1026 and 1027.
E Starting from January 1st, 2007 the journal METALURGIA INTERNATIONAL is also in the SCOPUS database, belonging to ELSEVIER BIBLIOGRAPHIC DATABASES – Amsterdam (Netherlands).
E We inform our authors and readers that our magazine “METALURGIA INTERNATIONAL” is introduced starting from year 2005 in THOMSON SCIENTIFIC MASTER JOURNAL LIST, letter M, position 400. For next information please access www.isinet.com position <http://scientific.thomson.com/cgi-bin/jrnst/jresults.cgi>
We informed already CNCIS, which in the framework of evaluations to be done in the first half of 2008 will introduce our magazine in category A
E THE BRITISH LIBRARY – Londra (Anglia), starting from year 2008

1. The “METALURGIA INTERNATIONAL” magazine receives manuscripts of papers including basic scientific research and industrial research in the following fields: metallurgy, materials science and engineering and different relating processes.
2. Original papers not previously publishing in any other journal, or not sent for publishing before, are accepted.
3. After publication, the copyright is transferred to the publishing house.
4. Every manuscript will be referred, their reports form the basis of the Editor's decision.
5. The manuscripts sent to the Editor will not returned to the author, even they are not published.
6. The manuscripts will be sent to the following address:
METALURGIA INTERNATIONAL
83, Calea Griviței, sector 1, Postal code 010705, postal office 12
Bucharest, Romania
Tel.: +(40)-021-310 71 38; +(40)-021-0722 665 071;
Fax: +(40)-021-310 71 38
E-mail: redactia@metalurgia.ro; See also web: www.metalurgia.ro

REDACTION

ABSTRACT

Metalurgia International 7/2008

SUSTAINABLE DEVELOPMENT5 - 11

D.C.: 574.

Key words: elasticity and resistivity of the ecological quaternary alloys
VASILESCU DAN DRAGOȘ, VELICU STEFAN, DOBREA VIOREL,
CORĂBIERU PETRICĂ, ANIȘOARA CORĂBIERU : **Study of the mechanic-elastic and electric characteristics of the ecological quaternary alloys**
Metalurgia International (vol. XIII), no.7, 2008, p. 5

The values of the mechanic-electric characteristics of the special ecological quaternary alloys of type CuNiSiMn and CuNi4AlSi are placed at the inferior limit of the classic bronzes with beryllium. The values of the mechanic-elastic characteristics of the replacing alloys can be increased by mechanical hardening without influencing the value of the electric conductivity. The determination of the elasticity modulus E depending on temperature of the special ecological quaternary alloys has been performed using the non-conventional method of mechanic oscillations resonance. The present work studies the elasticity modulus E and the electric conductivity of the ecological quaternary alloys.

D.C.: 669.054; 574.

Key words: purification, gases, sonic agglomerate, device
CIUREA AUREL, BORDEI MARIAN: **Considerations on the separation of the smoke particles through sonic agglomeration device**
Metalurgia International (vol. XIII), no.7, 2008, p. 9

The metallurgical industry represents a high pollution potential, both because of the numerous raw materials and used material and also because of the specific technological equipment and processes. In this way specific to metallurgy is the pollution of the atmosphere with powders and gases because of the impurities present in the raw material and because of the un-hermetical technological operations.

Among the procedures of the gases purifications those that use the agglomeration device are recommended in these situations both as a efficiency and for the fact that they can be used in the case of hot gases too.

MATERIALS SCIENCE RESEARCH AND DEVELOPMENT 12 - 62

D.C.: 669.18.046

Key words: management, electric arc furnace, modelling
IOANA ADRIAN, NICOLAE AVRAM, BĂLESCU CEZAR: **Elements of electric arc furnaces' management**
Metalurgia International (vol. XIII), no.7, 2008, p. 12

The methodology for establishing a technological plant's best management strategy is based on the "technological process – technological plant" interdependences.

The paper presents the best management of a plant consist of an assembly of operations, measures and decisions, established and applied in order to make the technological process more efficient from the technical – economical point of view.

The optimization of steel elaboration in the electric arc furnace by mathematical modelling is about the optimization of the functional and technological performances of this multi-physics process.

The best management of the electric arc furnace (EAF) is based on the mathematical modelling of this complex process. This paper shows an original variant for optimizing the functional and technological performances of EAF, using management elements by mathematic modelling of the respective multi-physics processes, especially of charge preheating.

D.C.: 62-135; 620.9

CALEA GHEORGHE, CIOBANU EMIL, NICOLAE AVRAM, HAZEL MENADIL: **Considerations viewing the metallic materials utilized in the turbine blades construction**

Metalurgia International (vol. XIII), no.7, 2008, p. 16

The paper presents the main brands of metallic materials and the chemical composition and the mechanic characteristics of these steels utilized in the construction of turbine blades.

D.C.: 532.13

Key words: non-Newtonian mixtures, structural apparent viscosity, shearing stress, speed gradient, torsion moment

NEDEFF VALENTIN, ZICHIL VALENTIN, CARMEN SAVIN, MĂCĂRESCU BOGDAN, MOȘNEGUȚU EMILIAN, MIRELA PANAINTE, AMBĂRUȘ ALEXANDRU: **A new method to determinate the viscosity of the non-Newtonian mixtures**

Metalurgia International (vol. XIII), no.7, 2008, p. 21

In this paper, it was established theoretical relation for determination of the structural apparent viscosity which is born into the structural non-Newtonian mixtures. This rheological propriety characterizes the homogenization degree and power consumption needed by mixing operation. To establish the relation for structural apparent viscosity, we start from the shearing strains action to the mixing device and measuring of the torsion moment from the mixing device shaft with the electro resistive transducer TER.

D.C.: 669.14.018.25; 539.374

DANIELA FLORENTINA TĂRĂȚĂ, CEALÎCU DRAGOȘ: **Research regarding the selection of steels grades for hot working (Part I)**
Metalurgia International (vol. XIII), no.7, 2008, p. 27

The papers looks for a competent and operational method for steel grades selection, taking into account both nature and level of operation requirements, and their quality conditions, as far as of physical, chemical, mechanical and technological proprieties are concerned.

In the first part, the method structure and organisation principles are presented, giving at the same time examples of database for selection.

In the second part, the performed program is developed with choice examples, for hot working tools steel grades.

Examples for big size and stress dies, made of MARAGING type steel are given in the paper.

D.C.: 669.1.017

Key words: hypereutectoid steel, Adamit, chemical composition, hardness, microstructure, mill rolls

ANA JOSAN, LUCIA VÎLCEANU, PUȚAN VASILE, ANA SOCALICI: **Researches concerning the particularities of the hypereutectoid steel, using for casting the mill rolls**

Metalurgia International (vol. XIII), no.7, 2008, p. 33

The economical efficiency of the rolled products manufacturing highly depends on the quality of the roll, whose durability is determined both by the characteristics of the material the rolls are manufactured out of and by the operating conditions.

One very important aspect connected to the behavior in exploitation of the mill rolls is the knowledge of the materials characteristics of which they are made. In account with the fact that the rolls casted of Adamite type steel, with a high content of carbon and alloyed with Cr,Ni,Mo, used at the metallurgical company, have won a large dispersion at the medium and small section mill, as well as at the wire mill the determination of the mechanical characteristics of this type of alloyed being useful.

The paper introduces the results of statistical mathematical processing, by means of the MATLAB calculation program of the data related to rolling cylinders cast at the metallurgical company, in view of determining the optimal chemical composition domain and the possibilities of analysis the material

ABSTRACT

Metalurgia International 7/2008

characteristics of the Admit-type steel meant for casting hot rolling cylinders analysis. The experiments have been carried out on the test rings cut off the cylinders that are to be used. We analyzed the hardness variations, the traction resistance, as well as the macro and micro-structural characteristics.

From industrial practice has resulted that the utilization of such cylinders allows increasing of the rolling mills productivity, improving of the rolled products quality and a lower fabrication cost.

D.C.: 669.1.017

Key words: austenitic stainless steels, corrosion properties; BRANDUSA GHIBAN, SORIA CIUCĂ, IRINA CARCEANU, GHIBAN N., NEDELICU I.: Austenitic stainless steels corrosion properties modified by silicon alloying

Metalurgia International (vol. XIII), no.7, 2008, p. 39

In the present paper there are presented results concerning comparative corrosion resistance of some austenitic stainless steels, with or without silicon content. The silicon content is varying in the range of 1-5 %, in a matrix of alloyed austenite, containing 20% Cr and 15-18%Ni and with very low carbon contents (lower than 0,03% C). There are investigated different types of corrosion resistance: intergranular corrosion in nitrogen media, stress corrosion resistance in chloride media, and transpassive behaviour in sulphuric media. The tested media contained nitrogen, as it follows: Huey test (65% HNO₃, at boiling temperature, 244 hours maintain), and 5N HNO₃ + 1g/l Cr⁶⁺ (144 h, b.t.). The media contained chloride is 45% MgCl₂ at boiling temperature, with a period of 1000 hours. The transpassive behaviour is tested in 10% HSO₄. The investigations were made by optic and electronic microscope, and the corroded surfaces were examined by scanning electron microscopy.

D.C.: 621.315.55

AGOP MARCEL, VIZUREANU PETRICĂ, IOANNOU P.D.: A theoretical approach of the quantum thermal conductance of electrons

Metalurgia International (vol. XIII), no.7, 2008, p. 43

Using the scale relativity theory it is shown that the "mechanical" behaviour of the nanostructures is hysteretic type by means of a generalized Navier-Stokes type equation with an imaginary viscosity coefficient, while the behaviour of the nanostructures, at the microscopic scale, is described by a Schrödinger equation. In the hydrodynamic formulation of the same theory, the quantization of the Hall conductance and particularly the Landauer's result are obtained. In such conjecture, using the Wiedemann-Franz relation, the quantum thermal conductance of electrons results.

D.C.: 621.746.62

CARCEA IOAN, ROMAN COSTEL, CHELARIU ROMEO, MIHAI DUMITRU, ȘTEFAN MIHAI: Experimental trial of the digital solidification simulation model

Metalurgia International (vol. XIII), no.7, 2008, p. 48

An EM (experimental model) was developed in order to study the solidification processes of non-ferrous alloys, cast in parts and to check the concordance between the digital simulation and experimental researches.

The program achieved rather accurate forecasts of solidification evolution.

For experiments, an Al-Si-Cu alloy, generally used for piston casting, was employed.

D.C.: 621.746.62

Key words: PhD thesis, cast iron, melting, casting CIOBANU IOAN, CRISAN AUREL, MUNTEANU SORIN: Ph. D. thesis in the field of cast iron, casting and solidification

Metalurgia International (vol. XIII), no.7, 2008, p. 55

The paper realizes a short synthesis of the Ph.D. Thesis public presented in the last time in Romanian Universities in the field of cast iron smelting and casting. There are shown – the advisory committee for public presentation; - the objectives followed by authors during the researches afferent to thesis – the chapters structure. The paper contains too, a short presentation of the content of own theoretical and experimental researches carried on by authors.

D.C.: 669.24

Key words: mathematical modeling, regression equation, mechanical properties, S.G. Cast Iron

MILOSAN IOAN: Study about the mathematical modeling's results of a nickel bainitic S.G. cast iron

Metalurgia International (vol. XIII), no.7, 2008, p. 59

The paper presented here belongs to the researches about the mathematical modeling's results of the mechanical properties of a Ni Austempered Ductile Iron.

The aim of the experiments is to determine the main mechanical characteristics: hardness (HB), tensile strength (R_m), impact strength (KC), elongation (A).

It was determined the representation of the linear regression (for HB and R_m) and polynomial regression (for KC and A) type and the values of the linear and polynomial regression coefficients are presented in this paper.

FINANCIAL ECONOMIC MANAGEMENT. ACCOUNTANCY IN METALLURGY... 63 – 68

Key words: strategy, neuro-linguistic programming, communication, enterprise, strategic communication

MANOELA POPESCU: Considerations regarding the usage of NPL in elaborating business strategies

Metalurgia International (vol. XIII), no.7, 2008, p. 63

The modern enterprise acts in a dynamic environment which forces permanent changes and considerable investment efforts in order to take the given opportunities. Obviously, the connection to the environment's opportunities is not an option but a necessity, especially in the process of globalization. In this situation a strategic vision is necessary both for the management or the development of the company's activities.

This orientation of the enterprise needs an integration process of current actions in a future conduct, in order to subordinate them to some long term objectives. However, it's about a global attitude, a proactive behavior that gives a meaning to all the company's actions and it can be obtained by neuro-linguistic programming. This is because the usage of NPL pattern within the company requires the creation of a proper reorganization of organizational strategies.

Key words: luxury market, investment policy, brand

OANA MIONEL: The economic foundation of the luxury industry

Metalurgia International (vol. XIII), no.7, 2008, p. 67

As we have talked about poorness and about its effects, mostly about the multiple attempts to reduce this disaster, results are not obvious as the poor world population is too numerous and less interesting, we prefer talking about wealth and luxury and state that this is the luxury age. By rephrasing the Romanian saying "one must pay to have a fine cheek", we may say that within the luxury industry, a luxurious "cheek" may only be preserved with high costs. By all means, the way we perceive luxury is different according to the three periods of this industry – past, present and future – and it is also different for each social class.