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## Metalurgia International 6/2008

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# ABSTRACT

## Metalurgia International 6/2008

SUSTAINABLE DEVELOPMENT .....5 - 17

**D.C.: 669.18.046**

**Key words:** electric arc furnace, management, mathematical modelling  
**IOANA ADRIAN, NICOLAE AVRAM, BĂLESCU CEZAR: Options for best management of electric arc furnace**

Metalurgia International (vol. XIII), no.6, 2008, p. 5

*The best management of the electric arc furnace (EAF) is based on the mathematical modelling of this complex process. 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. This optimization is based on many principles. The most important are:*

- *The principle of analogy – consists of competently observing and analysing the real model (technological process), using both analogy with other fields of research and logical homology.*
- *The principle of concepts – is based on the system's theory, including the feed-back concept.*
- *The principle of hierarchisation – consists of making a hierarchical models system, for structuring the decision and coordinating the interactive subsystems.*

*This paper shows an original variant for optimizing the functional and technological performances of the electric arc furnace (EAF), using management elements by mathematic modelling of the respective multi-physics processes.*

**Key words:** apparatus made for a aggressive medium  
**CALEA GHEORGHE, MIHAI ATANASIU, NICOLAE AVRAM: The metallic materials behaviour under corrosion, built-in apparatus made for aggressive medium**

Metalurgia International (vol. XIII), no.6, 2008, p. 9

*One of the most important problem raised during the service of a measurement and control device located in an inaccessible area containing in addition an aggressive medium, is to reach the upper lifetime limit of the active part of the apparatus (e.g. the sensitive element), knowing that usually this part works under fatigue corrosion phenomena.*

*The growth of the mean lifetime of the device supposes to apply one or more of the following paths:*

- *to choose the principles and technical solutions that allow the increase of the active parts mechanic strength without remission of their sensitivity;*
- *to realize the active parts by materials having improved features regarding the mechanical and corrosion behaviour;*
- *to protect the active parts with adequate coatings;*
- *to modify the electrical potentials;*
- *to modify the medium.*

**D.C.: 669.295**

**IVĂNUȘ RADU CRISTIAN, BĂBĂIȚĂ ILIE: Waste electrical and electronic equipment (WEEE) : a threat in the future**

Metalurgia International (vol. XIII), no.6, 2008, p. 12

*The flood of used and discarded information and communication equipment as well as other electronic products is a growing concern. In addition to the quantities of waste, there are a number of toxic substances that require special handling, and precious metals are being lost. E-wastes are customer electronic equipment that are no longer wanted. These include all electronic appliances such as television, washing machine, radio, computers, cellular phones, refrigerators, etc. The volume of discarded electronics generated is growing dramatically and exponentially. In the Philippines, a simple mathematical equation was used to estimate the expected number of e-wastes by relating the proportion of households owning by decile and the total number of household families with access to electricity and compared the value with the records of the National Institute of Statistics (NIS) to check its validity. The basis for this equation is the IPAT principle which states that if environmental impact falls, then the beneficial changes in technology must more than offset the combined effects of population and affluence. Advances in technology, decreasing product prices, and product designs that discourage upgrading and repair has increased the demand for new products and the disposal of*

*old ones. E-waste is a threat to the environment and to the health of the people. The government, manufacturer's and consumers have their respective role with the e-waste problem. The government must provide a strict and clear legislation regarding the disposal of e-wastes. The manufacturers must apply the design for the environment, use of less hazardous materials and provide recycling facilities. Lastly, the consumers must be properly informed and be responsible for the disposal of this futuristic waste.*

MATERIALS SCIENCE RESEARCH AND DEVELOPMENT ..... 18 – 59

**Key words:** machinability, criteria, composites  
**VELICU ȘTEFAN, MIRELA SOHACIU, PREDESCU CRISTIAN: Methodology for assessment the materials machinability**

Metalurgia International (vol. XIII), no.6, 2008, p. 18

*In this paper, machining parameters are defined and a unitary methodology of determining the machinability of materials is settled. The cutting forces, the durability of the cutting tool, the roughness of the resultant surface are settled by means of experimental equipment especially designed.*

*The results of the tests allow establishing a clear hierarchy regarding the machinability of materials by facing.*

**Key words:** thixotropy, semisolid processing, technological parameters  
**CIOATĂ VASILE GEORGE, KISS IMRE: Experimental research regarding the technological parameters of a new method of processing in the semisolid state**

Metalurgia International (vol. XIII), no.6, 2008, p. 21

*In this paper authors present a new method of processing in the semisolid state of the metallic alloys, shows particularities of these, points out the advantages of using this process for producing the pieces, presents experimental results concerning of the technological parameters of the process and settlement the dependency between these. The proposed method is original, and this utilization in the industrial practice is more advantages comparing with usual processing methods in the semisolid state, generating considerable economical effects.*

**D.C.: 669.14.018.8**

**PĂDUREAN IOAN, NEDELCU DORIAN, ELVIRA PĂDUREAN, ARPAD FAY, TRUȘCULESCU MARIN: Cavitation erosion resistance of the austenitic stainless steel from welding reconditioned hydraulic turbines blades zones**

Metalurgia International (vol. XIII), no.6, 2008, p. 26

*Samples of the austenitic stainless steel GX5CrNi19-10 have been thermally treated and tested under cavitation erosion. There have been obtained modifications of the cavitation resistance dependent on the thermal treatment by use of structural analyses and micro hardness tests the influence of microstructure on the steel cavitation resistance had been stressed out. The paper presents the researches carried on upon the cavitation erosion of austenitic stainless steel GX5CrNi 19-10 (SR EN 10283/99) [8] after solution treatment used for manufacturing Kaplan and Francis runner blades. The research is focused on the thermal influenced zones subsequently of the welding process performed in the repair work [5]. The thermal treatment of solution treatment followed by welding give a high cavitation erosion resistance to austenitic stainless steel GX4CrNi19-10.*

**Key words:** Lab view programmes  
**GHIMBĂȘEANU IOAN: Designing and interrogation a database by using MySQL, PHP and Labview programmes**

Metalurgia International (vol. XIII), no.6, 2008, p. 32

*The aim of the paper is to develop interactive software for monitoring the technological process. Thus, the conceptual, theoretical and methodological framework in IT for generating new instruments, technologies for specific applications in the area of technological process is created. Taking into account the state of the art of knowledge in this area, the following specific objectives are proposed in the paper: developing techniques and methods for data acquisition; designing programmes for a database containing the results obtained during the theoretical and experimental research; developing interactive programmes for monitoring the results obtained.*

# ABSTRACT

## Metalurgia International 6/2008

**D.C.: 621.746.628**

**Key words:** solidification, Fe-C alloys, cast iron, steel, modelling  
*MUNTEANU SORIN, CIOBANU IOAN, CRISAN AUREL:*  
**Mathematical model for solid fraction variation with temperature in steel and cast iron solidification**

Metalurgia International (vol. XIII), no.6, 2008, p. 37

*In realizing simulation software for alloy solidification it is necessary a mathematical modelling for solid fraction dependence on temperature. The equation describing the solid fraction variation are dependent on phase transformation types that alloys suffer during solidification: eutectic transformation, peritectic transformation, solubility variation depending on temperature, etc. The paper presents the equations describing the solid fraction variation in the case of iron-carbon alloys used by authors to create software for steel and cast iron macrosolidification simulation.*

**D.C.: 669.131.622**

**Key words:** materials science, bainitic S.G. cast iron, heat treatment, phase transformation

*MILOSAN IOAN:* **Aspects about the kinetics and thermodynamic transformation of a bainitic S.C. cast iron between 350 and 400°C**

Metalurgia International (vol. XIII), no.6, 2008, p. 45

*The paper contains a study about the kinetics and thermodynamics of the bainitic transformation of a S.G. Cast Iron during the isothermal heat treatment. By the help of Johnson-Mehl and Arrhenius equations it was described the activation energy "Q", rate coefficients dependent on temperature "k", exponent of reaction "n" and a constant dependent on frequency "A".*

**Key words:** semisolid, thixotropy, steel, microstructure, die forging  
*DANIELA CĂTALINA MILOSTEAN, ILCA IOAN:* **Laboratory stage experiments on the semisolid state steel die forging**

Metalurgia International (vol. XIII), no.6, 2008, p. 49

*The work presents the semisolid state processing of the steels. The semisolid state of a metal or metal alloy is the state in which it finds itself in the interval between the liquidus and solidus temperature from the equilibrium diagram.*

*Within the experiments performed depending on the configuration of the piece we designed the die, the punch and the counter punch. The experiments were performed in the laboratories of the Faculty of Engineering from Hunedoara on a pilot station made up of the Tamann Melting Furnace and the actual hydraulic press. In order to obtain a semisolid state globular structure the installation contains an adjustable vibration system of the die. The pilot stage experiments showed an actual improvement of the structure of the pieces obtained from steel through semisolid state processing compared to the ones obtained through the classic procedure.*

**Key words:** ferritic stainless steel, cold rolling strip, breakage susceptibility, thermal treatment

*BORDEI MARIAN, CIUREA AUREL:* **Particularities regarding the microstructural behaviour of the X6Cr17 stainless steel**

Metalurgia International (vol. XIII), no.6, 2008, p. 55

*The growth of the world stainless steel consumption is the result of some new domains development, of some demands and special conditions, fact that results from the adaptability of these alloys and from various domains of properties. It has a high resistance-weight proportion, it is extremely resistant to corrosion, usage and heating and it can be, relatively easily, malleable or welded. The stainless steel is, also, an excellent material from an environment protection point of view.*

*The special characteristics of the stainless steel create sometimes, some difficulties, during the working process that can lead to the rise of the production costs.*

*In this paper, we made an analysis of the causes of the ferritic stainless steel strips breakage during the preparation operations for cold rolling.*

### FINANCIAL ECONOMIC MANAGEMENT. ACCOUNTANCY IN METALLURGY..... 60 - 75

**Key words:** monetary policy  
*LEPĂDATU V. GHEORGHE:* **Anticipations of monetary policy in financial markets**

Metalurgia International (vol. XIII), no.6, 2008, p. 60

*Gruen et al.'s results highlight the stringent informational requirements inherent in an activist policy approach to handling assetprice bubbles. Europe's economy is highly developed and diversified, and its financial markets are deep; the debates provoked by the EMS crisis parallel those stimulated by its emerging-market successors (Eichengreen). Wennerlind claims that Hume used different analytical models when considering exogenous and endogenous money.*

**Key words:** management style, manager  
*VALENTINA ZAHARIA:* **Management styles – content, influence agents**

Metalurgia International (vol. XIII), no.6, 2008, p. 63

*Are presented the agents which influence the management styles, the criteria used to characterize the management styles.*

**Key words:** communication, company, communicational behavior, strategic communication, communicational culture.

*MANOELA POPESCU:* **The company – a global communication**

Metalurgia International (vol. XIII), no.6, 2008, p. 66

*In the economy based on knowledge, the communicational behavior received general valences, being used in an abusive way to explain the institutional deficits and the global communication seems to lead the modern patterns of social development. In this context, the communication is an essential phenomenon, process, art and a necessary science of the company regardless of the privileged methods of interaction between company and environment.*

*Regarding the large changes that mark the globalization phenomenon, because of the necessity of high performances, the company considers that communication is a major component of managerial process. This is because the business development is determined by an efficient communication. Therefore, communication offers the scientific, technique and practical support that can assure a high efficiency of the activities developed by the company, by generating a communicational culture in which all the members of the organization know the market, the product and the company.*

*Within the company, communication can be considered from at least two perspectives: from a cultural point of view and from a strategic point of view. Therefore, the organizational aspects that aim the strategic communication and the cultural differences are fundamental.*

**Key words:** coca bush, illegal laboratories, drug trafficking,, drug trade, drug control policy

*OANA MIONEL:* **The drug geopolitics in South America**

Metalurgia International (vol. XIII), no.6, 2008, p. 71

*This article wants to present some doubts concerning the drugs geo-politic in South America. The most interesting examples are Colombia, Peru and Bolivia: Colombia is the country with the largest illicit coca growing area and cocaine production in the world, in Peru grow the most solids coca fields and Bolivia is very important for the seizure of illicit laboratories.*



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