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# ABSTRACT

## Metalurgia International 8/2008

MATERIALS SCIENCE RESEARCH AND DEVELOPMENT ..... 5 – 65

**D.C.: 666.346.6**

**ADRIANA MIOARA COMȘA, MARIA NICOLAE: Applications of refractory concretes with low hydraulic binder content**  
Metalurgia International (vol. XIII), no.8, 2008, p. 5

*The paper contains a synthetical presentation on refractory concretes with low hydraulic binder content, their characteristics, the influence of additives on these characteristics, but also the advantages offered when using these concretes as compared with the usual ones. The summary of these advantages:*

- compactness is improved after burning at 1000<sup>o</sup>C
- improved mechanical strength
- reduced CaO content
- superior thermal shock resistance

**D.C.: 669.295**

**Key words:** titania coatings, thermally annealing, structure  
**STAMATE MARIUS, NEDEFF VALENTIN, LAZAR G., IULIANA LAZAR: The influence of the thermally annealing to the structure and composition of titania coatings**  
Metalurgia International (vol. XIII), no.8, 2008, p. 7

*In the paper are revealed the changes in structural and composition of titania coatings prepared through a D.C. sputtering magnetron method, with thermally annealing. We find that there is a drastically change in structure and composition of the titania coatings. Changes that are extracted from the measurements of the optical properties such are optical transmission, refractive index and extinction coefficient and optical band gap with the annealing treatment. We have found the possibility to prepare titania coatings with controlled structure and composition by using the annealing process.*

**Key words:** nanostructures

**AGOP MARCEL, VIZUREANU PETRICĂ, IOANNOU P.D.: On the heat transfer in nanostructures**  
Metalurgia International (vol. XIII), no.8, 2008, p. 10

*Considering that the micro-particle trajectories at the nano-scale are described by continuous and non-differentiable curves, i.e. on fractals, we explain the thermal anomaly of nanostructures (increase of the thermal conductivity) by means of the dilaton concept. In such a conjecture, for certain values of the thermal gradient, the dilaton disintegrates, freeing energy in the process – as a result thermal conductivity in nanostructures is unexpectedly increased.*

**D.C.: 658.2**

**Key words:** shear, reliability, maintainability  
**VASIU TEODOR, ADINA BUDIUL – BERGHIAN: Reliability and maintainability of a shear for cutting metallurgical products**  
Metalurgia International (vol. XIII), no.8, 2008, p. 21

*This survey presents a practical method to determine the reliability and maintainability of a shear for cutting metallurgical products, starting from studying its operation in industrial conditions up to the processing of collected experimental data. Conclusions offered by the calculated values of reliability and maintainability parameters allow to assess the operation/failure of the shear for the further periods of this survey, with the related technical and financial implications.*

**D.C.: 669.35**

**Key words:** copper refining, residual concentrations, impurity removal, activity coefficient

**HOTEA VASILE, IRINA SMICAL, BĂDESCU GABRIEL: Thermodynamical considerations regarding the residual concentration calculation of impurities within the copper oxidative refining**  
Metalurgia International (vol. XIII), no.8, 2008, p. 28

*An efficient leading of the copper oxidative refinement assumes the grasp of the theoretical limits for impurities removal (residual concentrations), limits that depend of several factors as: temperature, the activity coefficients of the system constituents, the oxidation degree of the metallic bath, the initial impurities concentration (Me') in copper, so on. The most calculations that have been made in this aim take into account only the temperature factor, the system being considered ideal, in the special literature being one of the few papers that admit a real behavior of the system. Within this paper a theoretical study with new elements has been made, concerning the thermodynamic removal of some accompanying elements from the crude copper. The proposed method takes into account the real system behavior in order to determine the theoretical limits for impurities removal (residual concentrations).*

*The greater iron affinity for oxygen in proportion to the basic metal has allowed very little iron residual concentrations achieving, irrespective of the process parameters value. In accordance with the achieved data, a very low impurities concentration is achieved in conditions that the bath is saturated in oxygen, and their initial content is very low.*

**D.C.: 621-427.4; 677.72**

**Key words:** contact pressure, life – time, finite element method, GAP elements

**LUCIA VÎLCEANU, PUȚAN VASILE, ANA JOSAN, GHITA EUGEN: Strength of steel wires ropes in contact**  
Metalurgia International (vol. XIII), no.8, 2008, p. 34

*The paper shows the research regarding the induced and deforming stress at the moment of contact between wires and the traction cable take-up roller. The results will be used to calculate the fatigue crack propagation and to estimate the steel rope working life.*

**D.C.: 669.71**

**Key words:** FBCVD method, aluminum deposition, stainless steel, powder metallurgy

**BRANDUSA GHIBAN, IRINA CARCEANU, CRĂCIUN ȘTEFAN, GHIBAN NICOLAE, NEDELICU IOAN: Obtaining possibilities of aluminum thin films on supports processed through powder metallurgy**  
Metalurgia International (vol. XIII), no.8, 2008, p. 38

*In the present paper there are given preliminary and laboratory condition experimental results concerning a thin aluminum substrate on metallic support through FBCVD method. The metallic support was obtained through specific methods of metallurgy of powders; and they are made of stainless steel 316 AISI type. Fluidization experiments put in evidence the relation between fluidization velocity and compression breaking; the fluidization curve was determined at 1120°C. The deposition experiment was carried out at a temperature of 610°C for 30 minutes maintaining time and the obtained substrate has a thickness of 9.18866 μm.*

# ABSTRACT

## Metalurgia International 8/2008

**D.C.: 620.193.2**

**Key words:** corrosion; spectrometry; Roman Mirror; bronze artefacts

**RODICA-MARIANA ION, IRINA DUMITRIU, DOINA BOROS, ISAC D., MIHAELA-LUCIA ION, FIERASCU RADU-CLAUDIU, CATANGIU ADRIAN: Characterization of corrosion products on Roman Mirror**

Metalurgia International (vol. XIII), no.8, 2008, p. 43

*The chemical and structural examination of the surface corrosion products grown on archaeological bronzes has been the subject of study for at least 170 years. During the last decades, scientists have made extensive use of different analytical methods to investigate the complex structure and the composition of the bronze corrosion products i.e., the patina and to find a relationship between this information, the environment in which they are formed and the micro-chemical structure of the alloys. This innovative approach has been utilised in order to gain further insight into the microchemical structure of the corrosion products as well as for selecting the cleaning and restoration methods. This innovative approach has been utilised in order to gain further insight into the microchemical structure of the corrosion products as well as for selecting the cleaning and restoration methods. The corrosion products, i.e., the patina, grown on archaeological bronze artefacts used by Romans, have been studied in this paper. Microscopy-related techniques are useful in understanding the topological state of the corroded layers and in analysing their cross-sections.*

**D.C.: 621.77.016.3**

**Key words:** cold rolling mill, strip, vibration, prediction, and undulation

**DRAGOMIR STEFAN, FLOREA GHEORGHE, FLOREA BOGDAN: Vibration diagnosis systems in a cold rolling mill machine**

Metalurgia International (vol. XIII), no.8, 2008, p. 47

*In this work is shown the importance to use a monitoring by vibration system for a cold rolling mill machine. The using of this monitoring vibration system reduce maintenance costs, minimize the impact on operation because is monitoring the rolls, the backup rolls, the coupling shaft, the gears from actionnary*

*system. Another advantage is to preventing damage occurring by detecting signs of abnormalities. The accurate prediction of works parameters is essential for a product quality. Currently, a mathematical model is used. It is important to directly predict the roll force and the other parameters, to compute a corrective coefficient. Using a mathematical model, we grove up the possibility to obtain a new quality for laminates strip. This system made a comparison between the oscillation recorded for the rotation parts at the beginning of work (when mill machine is made in function for the first date ) and the oscillation who appear after a while in work because is possible damages or abnormalities.*

**D.C.: 621.77.016.2**

**Key words:** steel, regression analyses, mark polygon, characteristics of resistance

**ILCA IOAN, CARMEN CHITARU, DANIELA-CĂTĂLINA STOICA: Quality performances establishment for hot-rolled products**

Metalurgia International (vol. XIII), no.8, 2008, p. 53

*This paper is issuing the results obtained through research done in industrial conditions of establishing the way in which the type of steel and the technological factors of plastic processing influence the value of the characteristics of the quality and the possibility to operative establish these values in the stages of manufacturing process by the intermedium of the mark polygon, without being necessary to make final analysis or laboratory tests. The obtaining of a mark polygon guaranties a growth of the minimum quality characteristics: resistance to breaking  $R_b$ , resistance to flowing  $R_e$ , elongation  $A_5$  improving the characteristics of the steel.*

**D.C.: 669.14.018.25; 539.374**

**CEALÎCU DRAGOȘ, DANIELA FLORENTINA TĂRĂȚĂ: Research regarding the selection of steels grades for hot working (Part II)**

Metalurgia International (vol. XIII), no.8, 2008, p. 59

*The selection process steel grades destined to manufacturing of tools for hot working tools, using the computerized selection program, is presented in this paper. The computerized selection program was presented previously.*



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