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ABSTRACT

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RESEARCHES IN THE
MATERIALS SCIENCE FIELD5 - 61

D.C.: 669.18.046; 517-982

Key words: the efficiency of the steel degassing process
MARIA NICOLAE, CĂLAE MĂNDRU, NICOLAE AVRAM: The influence of inclusions on the efficiency of the steel degassing process
Metalurgia International (vol. XIII), no.4, 2008, p. 5

There are no concrete information referring to the manner in which inclusions (S,P, etc.) influence the degassing process of steels (hydrogen, nitrogen and oxygen removal). This aspect is inconvenient for the pre-directing activity of degassing equipment functioning. In this context, the authors of the paper present the results of own researches on the manner in which sulphur can be determinant in the kinetics of the nitrogen removal process, when bubbling with argon.

D.C.:669.162.267

Key words: using different auxiliary combustibles
CONSTANTIN NICOLAE, DOBRESCU CRISTIAN, RALUCA PETRACHE, MIRON BUZDUGA: Mathematical model on the correlation of the combustion's zone parameters in case of using different auxiliary combustibles
Metalurgia International (vol. XIII), no.4, 2008, p. 7

The physical and chemical processes that are developing in the combustion zone of the blast furnace depend on many physical and metallurgical parameters, such as: blast air flow, oxygen content in blast air, humidity, pressure and blast air flow temperature.

The presented mathematical model establishes the correlation between blow parameters mentioned before and a performance function that is used to reflect precisely the development of the physical and chemical processes in the combustion zone of the blast furnace in case of using various auxiliary combustibles. This performance function is the theoretical temperature of the oxidant zone.

The establishment of the model equations was made starting from the functional real data of 1000 m³ blast furnaces.

D.C.:621.785

Key words: Materials Science, bainitic s.g. cast iron, heat treatment, phase transformation

MILOSAN IOAN: Aspects about the kinetics and thermodynamic transformation of a Mo-Ni-Cu special S.G. cast iron
Metalurgia International (vol. XIII), no.4, 2008, p. 11

The paper contains a study about the kinetics and thermodynamics of the bainitic transformation of a special S.G. Cast Iron alloyed with Mo-Ni-Cu, during the isothermal heat treatment. The temperature at isothermal level was 300, 350 and 400°C. 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".

D.C.: 621.983.3

Key words: microstructure, mechanical characteristics, critical deformation degree, recrystallization

POTEAȘU OCTAVIAN, FLORENTINA POTEAȘU, TAMARA RADU, ALEXANDRU PETRICĂ: Research regarding the influence of the deformation degree on the characteristics of deep drawing sheet steel
Metalurgia International (vol. XIII), no.4, 2008, p. 16

The paper presents the microstructural changes and those of the mechanical and technological characteristics of a steel for deep drawing, cold rolled and recrystallized heat treated. The research was conducted on samples taken from cold rolled strip, treated and re-rolled after the ARCELOR MITTAL technology and, for comparison assays sampled from the steel strip before cold deforming (hot rolled) were used as blank tests. The thermal processing of the cold deformed assays, having different degrees of deformation "ε" (2,2%; 6,5%; 15,2%; 32,5%; 50,0%; 65,0%) and of the blank tests (ε = 0%) were carried out under industrial conditions in a bell furnace.

The microstructures made for different deformation degrees show, for high deformation degrees (over 50%), a fibrous structure clearly seen on longitudinal sections.

The microstructures made from assays with different deformation degrees and industrially thermal treated show that the critical deformation degree for the analyzed steel is around 6.5%, the

point where the granulation starts to grow in excess. Also for deformation degrees over 32.5% the non-uniformity of the longitudinal and transversal granulation diminishes.

D.C.: 669.295

Key words: elaboration, mathematical model, evaporation process, control of chemical composition, titanium alloy

CHELARIU ROMEO: The influence of some electron beam melting parameters on the chemical composition of Ti5Al2.5Fe alloy
Metalurgia International (vol. XIII), no.4, 2008, p. 23

In the present paper a evaluation of alloying elements losses during the electron beam melting of Ti5Al2.5Fe alloy is performed. To evaluate the alloying element losses an own mathematical model of alloying element evaporation process was used. Using the mathematical model the Fortran SIM_EVAP program was performed. The SIM_EVAP program was used for numerical simulation of alloying elements evaporation process during electron beam melting. The inputs of the program are the chemical composition and weight of initial ingot, thermodynamic data about evaporation process (the vapor pressure in standard state, the thermodynamic activity coefficient, the Langmuire's evaporation coefficient) as well as the range of values of the process parameters, which were taken into account (melting rate, metal bath surface temperature and area). The outputs of the program are the variation coefficients of alloying elements, the chemical composition, and weight of final ingot. The highest losses of alloying elements are determined by the minimum value of melting rate and the maximum values of both temperature and area of metal bath surface.

D.C.: 621.785

Key words: experimental technique, oval furnace, convection, saving energy

ALINA ADRIANA MINEA: Experimental technique for increasing heating rate in oval furnaces
Metalurgia International (vol. XIII), no.4, 2008, p. 31

The critical analysis of the intensification techniques of the transfer processes is realized by the very identification of the methods that can be applied, regardless of the process nature. In this context, the study of the heat transfer processes has become an essential aspect for assuring an optimum functioning of the industrial heating processes and this fact creates the basis of the multidisciplinary study of these processes. The main priority is the development of a consistent methodology that will represent the base of the specific practical methods' development.

The determination of the research directions has been performed by the critical analysis of the intervention possibilities upon the heating processes at an average temperature. Thus, for the study of processes efficiency there has been chosen a thermal treatment oval furnace, muffle type, with a horizontally door drive which ensures a very good sealing of the working space, as well as different heating speeds.

The working methodology proposed for studying the constructive and functional improvement of the oval furnace used at average temperatures has the following phases: choosing a pattern charge and a technological process; choosing a heating temperature; modifying the working space by using some adjustable radiant panels; performing the experiment and the analytical interpretation of the results.

The selection of the heating temperature has been performed according to the thermal field used for tempering by putting the aluminum alloys in solution at a temperature of 475-525°C. Changing the working space by introducing some radiant panels has the purpose of intensifying the heat transfer by convection and radiation.

D.C.: 537

Key words: matlab programming, numerical solve, heat-conduction equation

LEPĂDATU V. DUMITRU : Matlab procedures for numerical solve of the heat-conduction equation with variable temperature to ends of rod
Metalurgia International (vol. XIII), no.4, 2008, p. 36

The aim of this paper is to show how can be solved of a same problem using the matlab programming system. We present the facility of solving this problem using finite differences method and argues the possibility to recall for this matlab procedure to others problems. We states and possibility to plot and export of the solution.

Continuous ABSTRACT

Metalurgia International 4/2008

D.C.: 669.295

Key words: treatment of the P/M Ti-6Al-4V

IVĂNUȘ RADU CRISTIAN: Effect of heat treatment of the P/M Ti-6Al-4V
Metalurgia International (vol. XIII), no.4, 2008, p. 41

Titanium alloys parts are ideally suited for advanced aerospace systems because of their unique combination of high specific strength at both room temperature and moderately elevated temperature, in addition to excellent corrosion resistance. Despite these features, use of titanium alloys in engines and airframes is limited by cost. The alloys processing by powder metallurgy eases the obtaining of parts with complex geometry. In this work, results of the Ti-6Al-4V sintered alloy are presented. Samples were produced by mixing of initial metallic powders followed by uniaxial and cold isostatic pressing with subsequent densification by sintering between 900 up to 1500 °C, in vacuum. Sintered samples were characterized for phase composition, microstructure and microhardness by X-ray diffraction, scanning electron microscopy and Vickers indentation, respectively. It was shown that the samples were sintered to high densities and presented homogeneous microstructure from the elements dissolution with low interstitial pick-up. The influence of the solution treatment at 1050 °C, 950 °C and 800 °C with water or air cooling followed by aging treatment at 550 °C was investigated on the specimens from Ti-6Al-4V model titanium alloy. After the treatments 1050 °C/water and 950 °C/water α' martensite structure was created, in the other cases a lamellar structure of $\alpha + \beta$ phases was formed.

D.C.: 621.746.628

Key words: PhD thesis, steel, melting, casting.

CIOBANU IOAN, MUNTEANU SORIN: Ph. D. Thesis in the field of steels smelting and casting
Metalurgia International (vol. XIII), no.4, 2008, p. 46

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

D.C.:621.74

Key words: steel, micro-coolants, casting, ingot, solidification

ANA SOCALICI, ERIKA ARDELEAN, HEPUT TEODOR, ARDELEAN MARIUS: The influence of micro-coolants on the mechanical proprieties of the carbon steels

Metalurgia International (vol. XIII), no.4, 2008, p. 50

In the paper there are presented the possibilities of improving the mechanical characteristics of the carbon steels by using micro-coolants at their casting.

The experiments made aimed to study the control of the steel ingot solidification by adding grains of crystallization in the central zone, in order to influence the internal structure and the mechanical characteristics of the steel. The heterogeneous germination simulation, on surfaces generated by particles introduced in the centre of the melted ingot, leads to the formation of a front of secondary solidification and of heat absorption in this zone. The data obtained by the researches were processed within the own calculation program SIDHDS and Matlab program resulting multiple correlation equations that render the mechanical characteristics variation of the carbon steel function of the technological casting parameters. The program allows the regression surfaces of two and three degree of the contour curves to be obtained.

Using the graphical and analytical correlations allows to establish the optimum technological variation ranges of the micro-coolant carbon steel casting parameters in order to obtain the desired mechanical characteristic values.

D.C.:669.4/8

Key words: heavy metal, toxicity, poisoning, health

CRISTIANA RIZESCU, ELENA CIRSTEA: Lead poisoning

Metalurgia International (vol. XIII), no.4, 2008, p. 56

Lead is a [chemical element](#) in the [periodic table](#) that has the symbol **Pb** (Latin: plumbum) and [atomic number](#) 82. A soft, [heavy](#), [toxic](#) and [malleable poor metal](#), lead is bluish white when freshly cut but tarnishes to dull gray when exposed to air. Lead is used in building construction, [lead-acid batteries](#), [bullets](#) and [shot](#), and is part of [solder](#), [pewter](#), and fusible [alloys](#).

Lead has the highest [atomic number](#) of all [stable elements](#) - although the next element, [bismuth](#), has a half life so long it can be considered stable. Like mercury, another heavy metal, lead is a potent [neurotoxin](#) which accumulates in soft tissues and bone over time.

Lead is a [poisonous](#) metal that can damage nervous connections (especially in young children) and cause blood and brain disorders. Long term exposure to lead or its salts (especially soluble salts or the strong oxidant PbO_2) can cause [nephropathy](#), and [colic](#)-like abdominal pains.

FINANCIAL ECONOMIC MANAGEMENT. ACCOUNTANCY IN METALLURGY... 62 - 72

Key words: relative pricing of accruals and cash flows

LEPĂDATU V. GHEORGHE: Market efficiency and behavioral finance
Metalurgia International (vol. XIII), no.4, 2008, p. 62

By applying the collective wisdom on relative pricing of accruals and cash flows, Shivakumar's study helps sharpen strategies that are designed to take advantage of the post-earnings-announcement drift. Gruen et al. state that different views about the appropriate role of monetary policy in the presence of asset-price bubbles do not arise primarily because of differences about the objectives of monetary policy. Gale and Stokoe focus on accounting for internal managerial decision-making rather than accounting for reporting to external shareholders or other stakeholders.

Key words: credit, interest, euro-dollar balance, IMM s, imports, exports

MANOELA POPESCU, ROXANA IONESCU: The analyse of causes and effects of the Euro-Dollar fluctuations regarding the development of IMMs

Metalurgia International (vol. XIII), no.4, 2008, p. 65

In a society of knowledge in which the globalization process determines the major implications of any national economy on the world's economy, the instability of the American currency market has an impact on the international currency market, and implicit on the markets (of consumption, credit and currency) in general.

Determined by the evolution of the American market, by the European market and by the intervention of specific banking institutions (FED, BCE and BNR) the impact of the euro- American dollar fluctuation is major, especially on the IMM s. The necessity of analyzing the effects the Euro- American Dollar has on the development of IMM s derives from at the least the following consideration: the small and medium enterprises represent one of the most important sources of economic growth. The experience of the European Union is clearly demonstrating that the IMM s sector may have a substantial contribution in achieving the internal net produce, in creating new jobs and in stimulating the growth of exports. Also, the exchange rate has been in the last few years the variable that had the fastest and strongest impact on inflation and on inflation anticipations.

Key words: strategy, internationalization, international business operations, alliances and international co-operations, implantation abroad

Metalurgia International (vol. XIII), no.4, 2008, p. 71

VALENTINA ZAHARIA: The internationalization strategy of the companies in the metallurgical industry

This article is a presentation of the internationalization process and of the three types of strategies in the field of production and sales: the new product stage, the maturity stage and the standardization stage. The main types of international transactions are being reviewed and grouped in three categories: international business operations, alliances and international co-operations, implantation abroad. Drawing up the strategy for developing and penetrating the international market is an important quality of the management of a company with international vocation. It implies taking into account the evolution of the world background (the analysis of the external environment for evidencing opportunities and management risk) and the potential of the respective company (the company diagnosis for establishing its advantages and disadvantages within the international competition) with a view to determining the internationalization targets and forms.

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