

ABSTRACT

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M. M. MOURAD, A.A. NOFAL, M. A. WALY, M.R. EL KOUSSY AND I. RIPOSA

EFFECT OF RECYCLING FERROUS SCRAP CONTAINING RESIDUAL OF TIN, COPPER AND CHROMIUM ON THE PROPERTIES OF HYPOEUTECTIC GREY CAST IRONS

Keywords: Residual element-Sn, Cu, Cr, grey cast iron, steel scrap, inoculation

Abstract: Special emphasis is put on the influence of tin, copper and chromium as residual on chilling tendency, graphite morphology and characteristic parameters of cooling curves of hypoeutectic grey iron castings. 0.005-0.12wt.% Sn, 0.1-0.4wt.% Cu and 0.1-0.4wt.% Cr content was considered. The action of these elements added together in hypoeutectic grey irons inoculated and un-inoculated were investigated. The results showed that in hypoeutectic grey iron, at low cooling rate, the clear chill is not very sensitive to the Sn-content and minimum chill was noticed in irons containing 0.11wt.% Sn. The total chill slightly increases with Sn-content and maximum value was achieved at 0.09wt.% Sn. At high cooling rate, the clear chill is not very sensitive to the Sn-content and minimum chill was noticed in irons containing 0.006wt.% Sn. The total chill increases with Sn-content and maximum value was at 0.016wt.% Sn. Inoculation is rather powerful with eliminating the clear chill and decreasing the total chill. The graphite morphology of grey iron is affected by two factors, the solidification condition and inoculation treatment, irrespective of the residual elements levels. The presence of tin up to 0.12wt.% in hypoeutectic grey iron simultaneously with the (Cu + Cr) did not have a pronounced detrimental influence on the strength and wear properties of hypoeutectic grey iron.

Metalurgia International vol XIII 2009 pg.5

M.N. MIHĂILESCU, A. DIMA, I. RUSU THE SIMULATION BY ANALYSIS OF FINITE ELEMENT OF THE FLOW OF FLUIDS THROUGH POROUS MEDIA SUCH AS FILTERS OBTAINED BY SINTERING

Key words: simulation, fem, porous media

Abstract: The analysis based on finite elements is largely utilised in different scientific preoccupations. The paper is dedicated to fluid flow through porous media, especially for filters obtained by sintering

Metalurgia International vol XIII 2009 pg.15

CRISTINA BORTUN, BRÂNDUȘA GHIBAN, LILIANA SANDU, GHIBAN NICOLAE OPTIMIZATION OF DENTAL ALLOYS TYPE CoCrMo LASER WELDINGS BY HEAT TREATMENTS

Key words: CoCrMo alloy, removable partial denture, heat treatment

ABSTRACT: Dental alloys type CoCrMo are used over 50 years in removable partial dentures. By appearing of new welding laboratory devices it becomes possible the rehabilitate metallic components of removable partial dentures. Knowing quality and structural defects of both parent metal and welded metal is very important for obtaining high resistance and long term prosthesis. The aim of present paper is to determine some improving parameters of metallographic structure of CoCrMo cast alloys after applying dental techniques welding procedures. Some CoCrMo dental alloys were used: Wironit (Bego, Bremen, Germany) and alloy "C" (Vaskut Kohászati Kft - Budapest, Hungary). Six charges were cast from these alloys, containing 12 samples (40/30/0.5mm), which were welded by laser (Laser XXS miniSaldatrice - Orotig, Verona, Italy), in but joint configuration, without filling material. The same procedure was used for 10 metallic components for fractured removable partial dentures. There were used welded joints with filling material on one or both faces. The samples were welded after different welding parameters and different heat treatments and than they were metallographic examined. The combining of parameters in laser welding is very complex, depending on alloys composition, welding procedure, thickness and profiles of cast samples. For procedure safety, a reference welding must be firstly made for choosing the proper welding parameters. A heat treatment at 1050°C / 1 h seems to be the best choice for structure improving of CoCrMo alloy, which is put in evidence by metallography. The welded piece may be also heat treated for structural homogenization and hardness decreasing in welded zone. There were observed higher hardness values in welded zone in comparison with base metal. The best welded samples were obtained on „C” alloy of Vaskut company, followed by Wironit. The most efficient heat treatments for CoCrMo dental alloys are about 1200°C.

Metalurgia International vol XIII 2009 pg20

PĂDUREAN IOAN RESEARCHES UPON CAVITATION EROSION RESISTANCE OF STAINLESS STEEL USED FOR MOULDING KAPLAN AND FRANCIS HYDRAULIC TURBINES RUNNER BLADES

Keywords: Cavitation, erosion resistance, moulding, runner blades.

Abstract: Materials damage through cavitations erosion is a major problem which was attentive analyzed, in order to obtain some materials with a better cavitations erosion and corrosion resistance [1], [4]. In this context, the author stopped on the Austenite stainless steel, which has been studied regarding its cavitations erosion and corrosion resistance. Initially, the steel was subjected to three thermal technologic treatments [4], [5], [6]: the solution heat treatment; sensitizing annealing; the welding simulation (with corrosion study in the heat affected zones-HAZ). The results were compared and the proper recommendations were been made.

Metalurgia International vol XIII 2009 pg.27

MARIAN BORDEI, AUREL CIUREA, CONSTANTIN STANCIU CONSIDERATIONS REGARDING THE ATMOSPHERE OF THE THERMAL TREATMENT FURNACES FOR THE PLATES

Key words: crystallization, sonic ultrasounds, metals, melt

ABSTRACT: The parameters that characterize the atmosphere of the furnace for thermal treatment have been analyzed in this study. Oxidation of heat treated plates is due to thermo chemical causes and the determining factors of this process are the following: heat treatment temperature, exhaust gases composition and steel composition.

Metalurgia International vol XIII 2009 pg.31

DANIELA IVĂNUȘ RESEARCHES REGARDING THE DETERMINATION OF THE IONS FROM THE MINERAL WATERS OF THE OLTENIA WEST PLAIN

Key words: characteristic ions, mineral waters

ABSTRACT: This study takes into consideration the mineral waters from one of Oltenia's regions, The West Plain, an area without tradition as far as this activity field is concerned and its main purpose is to draw the specialists attention regarding these waters. The opening up of the mineral springs from Gighera-Dolj would bring great benefits both by their healing potentialities and by their properties that would make this area appropriate for the balneologic field, taking into consideration the fact that it is situated in the neighborhood of the Danube Flood Plain.

Metalurgia International vol XIII 2009 pg.34

IOANA IONEL, PADUREAN IOAN, CEBRUCAN DUMITRU, POPESCU FRANCISC, VIORICA CEBRUCAN (HAREA), GAVRILA TRIF-TORDAI, LUISA IZABEL DUNGAN POST-COMBUSTION REMOVAL OF CARBON DIOXIDE FROM FLUE GASES

Key words: CO₂ capture, monoethanolamine, biomass co-firing, fluidized bed combustion, emissions.

Abstract: the primary aim of this study has been to analyze and describe the process of capturing carbon dioxide from the flue gas by means of chemical absorption. A 35 wt% aqueous monoethanolamine solution has been selected for removing CO₂ from the flue gas stream. Separation of CO₂ has been carried out in a packed bed absorber. Inlet flue gas CO₂ concentration before absorption ranges from 15 to 20%. Secondly, the co-firing process of biomass with coal in a bubbling fluidized bed combustor has been briefly investigated. There were co-fired woody sawdust having a lower heating value of ~14 MJ/kg with a sort of lignite from the motru coal field (romania) characterized by a LHV of 9 MJ/kg. A share of 10% of sawdust in the fuel mix has been used. The co-firing tests have been performed on a 40 kW_{th} bfb test facility. Additionally, the SO₂ has been removed in a wet packed bed scrubber by means of two different scrubbing aqueous solutions, namely sodium hydroxide (2.5 wt% NaOH) and calcium hydroxide (2.5 wt% Ca(OH)₂) respectively. In order to reduce the NO_x level, ammonia has been injected into the flue gas upstream of the cyclone at temperatures of 300-350°C. Experimental results have shown that the emissions of CO₂, SO₂ and NO_x have been reduced. Co-firing of sawdust with lignite in fluidized bed has occurred without any operational problems.

Metalurgia International vol XIII 2009 pg.40

GEAMĂN VIRGIL THE IDEAL GAS LAWS CHANGINGS WHICH APPEAR IN THE FIELD OF HOT ISOSTATIC PROCESSING UNDER APPLYING HIGH TEMPERATURES AND PRESSURES CONDITIONS

Keywords: hip, ideal gas law, full density.

Abstract: Hot isostatic compression (HIP) involves the simultaneous application of pressure and elevated temperature to materials. The pressure applied, usually by a gas, is isostatic because it's developed in a suitable pressurized vessel by a fluid (even a gas is a fluid). Under these conditions of heat and pressure, internal pores or defects within a solid body or a powder compact collapse and weld up. Encapsulated powder and sintered components densify easily and faster than due to sintering alone. Therefore HIP is today used for a lot of applications.

like: upgrading castings (removing shrinkage pores in interdendritic space), densifying pre-sintered components, consolidation of powders and interfacial bonding. In this paper is given a worked example used in the field of hiping applications with changing related to the ideal gas law.

Metalurgia International vol XIII 2009 pg.47

**ELENA POP, VASILE HOTEA , AURICA POP, IOZSEF JUHASZ, MIHAI BUȚU, ROMULUS POP
THE MATHEMATICAL MODELING OF THE COPPER WIRE ROLLING -THE INFLUENCE OF THE IMPURITIES LIKE SELENIUM, TELLURIUM, AND BISMUTH PRESENT IN THE RAW MATERIAL UPON THE CONDUCTIVITY OF THE COPPER WIRE**

Key words: copper, rolling, conductivity, impurities

Abstract: By analyzing the influence of the impurities like selenium, tellurium and bismuth upon copper we can say that the selenium and tellurium are impurities that form fragile chemical compounds with a significant influence upon the structure and properties of copper. The bismuth is an insoluble impurity that forms with copper easily fusible eutectics. The mathematical statistics processing of the experimental data has pointed out a variation of the electrical conductivity of the copper wire (γ') in relation with the composition of the raw material. Thus, by knowing the composition of the raw material and by inputting the data into the computed mathematical model the electrical conductivity of the rolled copper wire can be determined.

Metalurgia International vol XIII 2009 pg.50

**CIOBANU IOAN, MUNTEANU SORIN ION, CRIȘAN AUREL, JIMAN VASILE. CHISAMERA MIHAI, MĂRGINEANU IOAN, LUCIA FIRESCU, , MARIA ROMAN
RESEARCHES ABOUT SOLIDIFICATION SIMULATION OF PARTS CAST IN MOULDS COLD HARDENED WITH FURAN RESIN**

Keywords: solidification, simulation, casting, mould, thermal conductivity.

ABSTRACT: It is shown that truthful of the results obtained by casting solidification simulation depends of thermal characteristics of the alloy and moulds. The authors realized a research to determine thermal conductivity substitutive coefficient of sand moulds cold hardened with furan resin. It was used the method of comparing the solidification time obtained by computer simulation with the time experimentally determined by advanced thermal analysis. The case of casting a grey cast iron plate with thickness of 20 mm it was analyzed. The thermal conductivity substitutive coefficient value that assure identical values for simulated solidification time with the experimental solidification time is $\lambda_{fo} = 0.84$ W/m/K.

Metalurgia International vol XIII 2009 pg.5 5

**MIRELA PANAINTE, NEDEFF VALENTIN, SCHNAKOVSKY CAROL, MOSNEGUTU EMILIAN, CARMEN SAVIN
THEORETICAL STUDY REGARDING THE POSSIBILITY TO DETERMINATION THE GRINDING ENERGY TO PRODUCTS WITH VARIABLE TEXTURE**

Key words: variable texture, grinding, textural property, energy consumption, grinding

Abstract: The papers present methods to determine the grinding energy, in grinding of products with variable texture as well as the factors which influence the grinding process in case of products with variable texture.

Metalurgia International vol XIII 2009 pg.62

**CONSTANTIN BRATIANU, AMZA VIRGIL DANUT
A STRATEGIC PERSPECTIVE ONMANAGING INNOVATION AND CHANGE**

ABSTRACT: The purpose of this paper is to analyze in an integrated perspective managing innovation and managing change, two emergent components of the strategic management. Innovation and change are of paramount importance for any company in realizing the competitive advantage in a turb management, focused on profit maximization, do not yield anymore a generic solution for business success and sustainability. To be successful me ulent business environment. Local optimization and short term thinking of the operational ans to develop strategies for getting a competitive advantage over other competitors. In this new perspective, innovation and change become the main processes within a successful company, and managing innovation and change develop as core competences for such companies. Managing innovation means the organizational capability to transform new ideas into new products and services and to commercialize them successfully. Managing change is associated to the implementation of innovations, and thus managing innovation and managing change should be considered as two organic components, integrated into the company strategic management.

Metalurgia International vol XIII 2009 pg.68

**. MOROȘANU COSTICĂ. IORGA GHEORGHE, TOFAN ION
NUMERICAL SIMULATION OF THE THICKNESS ACCRETIONS IN THE SECONDARY COOLING ZONE OF A CONTINUOUS CASTING MACHINE**

Key words: continuous casting, numerical model, solidification, cooling, steel

Abstract: The main goal of this article is to present some applications of a new numerical model to the continuous casting process. Industrial implementation of the software package developed in this context was made to the secondary cooling zone of a continuous casting machine at ArcelorMittal Steel S. A. Galati.

Metalurgia International vol XIII 2009 pg.72

CONTENTS
METALURGIA INTERNATIONAL vol XIV(2009), no.1
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M. M. MOURAD, A.A. NOFAL, M. A. WALY, M.R. EL KOUSSY AND I. RIPOSAN

EFFECT OF RECYCLING FERROUS SCRAP CONTAINING RESIDUAL OF TIN, COPPER AND CHROMIUM ON THE PROPERTIES OF HYPOEUTECTIC GREY CAST IRONS.....5

M.N. MIHĂILESCU, A. DIMA, I. RUSU

THE SIMULATION BY ANALYSIS OF FINITE ELEMENT OF THE FLOW OF FLUIDS THROUGH POROUS MEDIA SUCH AS FILTERS OBTAINED BY SINTERING.....15

CRISTINA BORTUN, BRÂNDUȘA GHIBAN, LILIANA SANDU, GHIBAN NICOLAE

OPTIMIZATION OF DENTAL ALLOYS TYPE CoCrMo LASER WELDINGS BY HEAT TREATMENTS.....20

PĂDUREAN IOAN

RESEARCHES UPON CAVITATION EROSION RESISTANCE OF STAINLESS STEEL USED FOR MOULDING KAPLAN AND FRANCIS HYDRAULIC TURBINES RUNNER BLADES.....27

MARIAN BORDEI, AUREL CIUREA, CONSTANTIN STANCIU

CONSIDERATIONS REGARDING THE ATMOSPHERE OF THE THERMAL TREATMENT FURNACES FOR THE PLATES.....31

DANIELA IVĂNUȘ

RESEARCHES REGARDING THE DETERMINATION OF THE IONS FROM THE MINERAL WATERS OF THE OLTENIA WEST PLAIN.....34

IOANA IONEL, PADUREAN IOAN, CEBRUCAN DUMITRU, POPESCU FRANCISC, VIORICA CEBRUCAN (HAREA), GAVRILA TRIF-TORDAI, LUISA IZABEL DUNGAN

POST-COMBUSTION REMOVAL OF CARBON DIOXIDE FROM FUEL GASES.....40

GEAMĂN VIRGIL

THE IDEAL GAS LAWS CHANGES WHICH APPEAR IN THE FIELD OF HOT ISOSTATIC PROCESSING UNDER APPLYING HIGH TEMPERATURES AND PRESSURES CONDITIONS.....47

ELENA POP, VASILE HOTEA, AURICA POP, IOZSEF JUHASZ, MIHAI BUȚU, ROMULUS POP
THE MATHEMATICAL MODELING OF THE COPPER

WIRE ROLLING -THE INFLUENCE OF THE IMPURITIES LIKE SELENIUM, TELLURIUM, AND BISMUTH PRESENT IN THE RAW MATERIAL UPON THE CONDUCTIVITY OF THE COPPER WIRE.....50

CIOBANU IOAN, MUNTEANU SORIN ION, CRIȘAN AUREL, JIMAN VASILE. CHISAMERA MIHAI, MĂRGINEANU IOAN, LUCIA FIRESCU, MARIA ROMAN

RESEARCHES ABOUT SOLIDIFICATION SIMULATION OF PARTS CAST IN MOULDS COLD HARDENED WITH FURAN RESIN.....55

MIRELA PANAINTE, NEDEFF VALENTIN, SCHNAKOVSKY CAROL, MOSNEGUTU EMILIAN, CARMEN SAVIN

THEORETICAL STUDY REGARDING THE POSSIBILITY TO DETERMINATION THE GRINDING ENERGY TO PRODUCTS WITH VARIABLE TEXTURE.....62

CONSTANTIN BRATIANU, DAN AMZA

A STRATEGIC PERSPECTIVE ON MANAGING INNOVATION AND CHANGE.....68

MOROȘANU COSTICĂ, IORGA GHEORGHE, TOFAN ION

NUMERICAL SIMULATION OF THE THICKNESS ACCRETIONS IN THE SECONDARY COOLING ZONE OF A CONTINUOUS CASTING MACHINE