

ABSTRACT

Metalurgia International vol XIV(2009), no.2

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 HYPEREUTECTIC GREY CAST IRONS

Key words: Residual Sn, Cu, Cr; Grey cast iron; Inoculation
ABSTRACT The actions of Sn, Cu and Cr added together in hypereutectic grey irons inoculated and un-inoculated were investigated. At low cooling rate, the maximum clear chill and total chill were noticed in iron containing 0.05 % Sn in presence of 0.33 % Cu and 0.22 % Cr. The clear chill decreases at lower and higher Sn-contents and is completely suppressed at 0.12 % Sn even before inoculation. The latter completely suppressed the formation of clear chill and reduced the total chill formation by about 50 %. Inoculation is powerful within eliminating the clear and decreasing the total chill. In hypereutectic irons solidified under high cooling rate the increased Sn-content results in lower clear chill values irrespective of the Cr and Cu-contents. Inoculation was rather potent in suppressing the clear chill, also at high cooling rate solidification. The total chill is less sensitive and was decreased only when the Sn-content reached 0.1%-0.12%. The graphite morphology of grey iron is affected by two factors, the solidification condition and inoculation treatment, irrespective of the residual elements levels.

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VASILESCU MARIUS, VASILESCU IOANA

STUDIES AND RESEARCHES ABOUT THE HEAT TREATMENT PARAMETERS FOR 2090 ALLOY

Cuvinte cheie: aliaje de aluminiu, tratament termic, parametrii, proprietati mecanice

Abstract The aluminum alloys of 2090 type with high content of lithium (1.9-2.6%Li) are the most studied and tested alloys for the aerospace industry last years because of the lower density and higher mechanical properties that correspond to the aerospace constructions. The paper presents studies and researches about the heat treatment parameters of the Al-Li-Cu-Mg-Zr alloy of 2090 type. The experimental alloy, casted and deformed in semi-industrial conditions, was quenched at 520°C with different maintaining time and then ageing at 180°C with different maintaining time. The aim of the paper is to settle the adequate heat treatment parameters for the experimental alloy function of the mechanical properties that we obtain.

Keywords: aluminum alloys, heat treatment, parameters, mechanical properties

Rezumat Aliajele de aluminiu de tip 2090 cu un continut ridicat de litiu (1.9-2.6%Li) sunt cele mai studiate si testate aliaje pentru industria aerospaciala in ultimii ani datorita densitatii scazute si proprietatilor mecanice ridicate care corespund constructiilor aerospaciale.

Lucrarea prezinta studii si cercetari privind parametrii de tratament termic pentru aliajul Al-Li-Cu-Mg-Zr de tip 2090.

Aliajul experimental, turnat si deformat in conditii semiindustriale, a fost calit la 520°C cu diferiti timpi de mentinere si apoi imbatrinit la 180°C cu diferiti timpi de mentinere. Scopul lucrarii este de a stabili parametrii adecvati de tratament termic pentru aliajul experimental in functie de proprietatile mecanice obtinute.

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BALAN GEORGE, CIUREA AUREL, BORDEI MARIAN

THE THERMO-MOISTENING SONIC TECHNOLOGY OF THE SMOKE GASES IN THE ELECTRICAL FILTERS OF THE THERMO-ELECTRICAL PLANTS

Keywords: sonic technology, thermo-moistening, filter

ABSTRACT The growth of the thermo-electrical power station, corresponding to the present energetic demands and worsening the coal quality, because of the mineral resources exhaustion, leads to the massive pollution of the atmosphere, with ash particles, because of the evacuation of the burning gases, insufficiently purified in electro-filters. In the present paper, the growth of the gases purification efficiency in electro-filters using the sonic technology is presented.

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.DOBRE DANIEL, SIMION IONEL

MATERIALS SELECTION FOR IMPROVING THE PERFORMANCE OF FLEXIBLE MEMBRANES FROM THE STRUCTURE OF ELASTIC COUPLINGS

Keywords: metallic flexible couplings, membrane, fretting corrosion, axial and angular misalignments.

Abstract: This article describes the design of membrane couplings with reference to the influence of axial and angular misalignments on membrane stress. It is shown that these couplings are capable of satisfying the demand for higher powers and higher speeds with significant misalignments. The elastic contacts located between membranes and between membrane's packets and half couplings are considered. Friction between membranes inside packet generates fretting corrosion phenomenon and damages membranes. This failure mechanism, fretting corrosion, could be a significant cause of failure and hence the examination of parameters affecting fretting corrosion, membrane material selection and membrane surfacetreatments are discussed. The paper concludes with an evaluation of fretting susceptibilities, materials selection and characterization, materials compatibility assessments. Metalurgia International vol XIV 2009 pg.21

IOAN VASILESCU, ELISABETA VASILESCU ANA DONIGA

RESEARCHES REGARDING THE INFLUENCE OF CONTROLLED ROLLING ON THE STRUCTURE AND PROPERTIES OF THE SHIPBUILDING PLATES STEEL

Abstract: The growing demand of plates characteristics for the manufacture of components for the chemical, oil and naval industries requires sessions consideration on entering new steel grades and new preparation technologies able to improve the structure and mechanical characteristics of the plates, without considerably affecting the factory prices. Some unconventional heat treatments already have a certain practical applicability or tend to be applied on an ever larger scale at semi-industrial or industrial level. Of these treatments, the thermomechanical ones, namely the controlled rolling applied to low-alloyed plates, considerably improve the characteristics required for applying these steels and can replace the classical heat treatments. This paper presents the results industrial scale researches on the influence of the controlled rolling on the characteristics of high yield point plates of weldable fine grain steels. The following are revealed: the comparative study of the mechanical characteristics obtained by the classical process and by the controlled rolling process, the possibility of replacing the classical heat treatment for some steel grades, for plates for metallic structures in railway bridges, high tonnage travelling cranes, marine platform bases, high pressure vessels, etc. Metalurgia International vol XIV 2009 pg.26

VERMEŞAN HORAŢIU, VERMEŞAN GEORGE

LASER SURFACE HARDENING BEHAVIOUR OF GRAY CAST IRONS

Keywords: Cast iron, surface hardening, LASER

Abstract: This paper reports on surface hardening behavior of gray cast irons heat-treated with a laser beam with a wavelength of 1.06 µm (Nd:YAG laser). Three types of gray cast iron were used for the experiments: one ferritic, second pearlitic and third pearlitic with a significant amount of ternary phosphorous eutectic. The paper focuses on structures and hardness values obtained after laser beam quenching under various regimes.

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CHELU GHEORGHE, GHIBAN NICOLAE, ŞERBAN NICOLAE, BRÂNDUŞA GHIBAN, ŞABAN RAMI

EXPERIMENTAL RESEARCHES CONCERNING THE PLASTICITY OF SOME STEELS USED FOR FORGING TOOLS MANUFACTURE

Key words: tool steel, plasticity, plastically forming degree.

Abstract In order to establish the plasticity variation curves considering the temperature for some tool steels used for forging tools manufacture, there were studied five types of experimental steels: 36VSiWMoCr53 (W.2606), 31VMoCr29 (W.2365), 55MoCrNi16 (W.2713), 57VMoCrNi17 (W.2714) and 155MoVCr115 (W.2601). From the value's point of view, the plasticity of these five types of steels goes up to over 40% in the studied temperatures interval. Metalurgia International vol XIV 2009 pg.35

LILIANA SANDU, POROJAN SORIN, TOPALĂ FLORIN
CIULUVICĂ RADU, RUSU MUGUREL, DANIELA STANA

**EFFECT OF DESIGN MODIFICATIONS ON REMOVABLE
PARTIAL DENTURES LINGUAL BAR RIGIDITY – A FINITE
ELEMENT ANALYSIS STUDY**

Abstract Objective: The aim of the research was to investigate the effect of lingual bar major connector design on flexing and torque resistance by means of three-dimensional finite element analysis.

Material and methods: Experimental Co-Cr lingual bars of different cross-sectional shapes and dimensions were modeled. Rigidity tests were performed by measuring relative displacements and von Mises stresses generated under simulated torsional and compressive loads.

Results: Stresses and displacements under compression loading were higher than those obtained for torsional loading for half-oval cross-sectional shapes and lower for half-pear cross-sectional shapes. For the same cross-section area, resulted displacements and stresses were smaller for bars with an increased thickness/height ratio. Stresses and displacements of the lingual bars are strong influenced by the length.

Conclusion: The results of this in vitro study suggest that the most important factor in achieving rigidity in the mandibular connector is to correlate the shape of the cross-section to the dimensions of the lingual bars.

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SANDA LEVCOVICI, ALEXANDRU PETRICĂ, SIMONA
BOICIUC

**CHARACTERIZATION OF SOME POWDERS USED AS
ADDITION MATERIALS IN LASER CLADDING TECHNOLOGY**

Keywords: nickel alloy powder, high speed steel powder, shape, microstructure, micro hardness, granulometric distribution, fluidity.

Abstract The paper reports the characterization of two powders used as addition materials in laser cladding technology. The chemical composition, particles shapes, granulometric distribution and size,

powder micro hardness and microstructure analysis, technological properties according to the apparent density and fluidity was studied.
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ERMINA ȚAPU, MOCANU BOGDAN, ELENA
DRĂGULĂNESCU

**COMPLEX RESEARCH TO DETERMINE THE SOLDERING
ALLOYS WITHOUT PLUMB CHARACTERISTICS**

Keywords: plumb less technology, wave soldering, Lead Free alloys
ABSTRACT

The essential purpose of this article is to research the non plumb connection – LF (Lead Free) depending on the type of the soldering alloy and technology. Because the assemble conditions were substantially changed in the last few years going from a plumb soldering to a non plumb soldering, the idea of elaboration new soldering alloys with superior ecological qualities has appeared. It were determined the physical and mechanical proprieties, the humectation times, the surface defects for different non plumb alloys.

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LEPĂDATU V.GHEORGHE

**PROPERTY, PLANT AND EQUIPMENTS IN THE
METALLURGICAL FIELD
(IAS 16)**

Key words: property, recoverable amount, accounting policies, income, balance sheets, costs.

Abstract: The standard deals with all property, plant, and equipment. Property, plant and equipment are tangible assets held by an enterprise for use in production, supply of goods or service, rental, or administration purpose, and are expected to be used during more than one period. Examples include land, building, machinery, metallurgical field, ships, aircraft, motor vehicles, furniture and fittings.

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