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ISSN 0461-9579

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MATERIALS SCIENCE RESEARCH AND DEVELOPMENT

NUMERICAL STUDY OF THE QUASI-STEADY STATE TEMPERATURE FIELD BY A MOVING HEAT SOURCE FOR SURFACE TREADING

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Nicola BIANCO, Oronzio MANCA, Alina Adriana MINEA, Vincenzo NASO

Key words: Material processing; heat conduction; moving sources; thermal models.

Abstract: A numerical analysis of a quasi-steady state three-dimensional thermal conductive field induced in a metallic finite solid by a Gaussian moving laser beam is carried out using a finite volume numerical technique. The numerical simulation allows for both surface heat losses, convective and radiative, and variable thermophysical properties. The convective heat transfer on the outer surface of the solid is taken into account in order to simulate an impinging circular jet. This approach is suitable for any Peclet number value. The thermophysical properties of the solid are temperature dependent and radiative and convective heat losses, the latter due to an impinging gas jet on the upper surface, have been taken into account. Results in terms of dimensionless temperature profiles are reported in order to allow evaluating the main differences between heating with and without surface radiation and gas jet.

STUDY REGARDING THE OPTIMIZATION OF THE CUPOLA'S CHARGES

.....11
Ioan MILOSAN

Key words: optimization, cupola, charge, Simplex algorithm

Abstract: A numerical analysis of a quasi-steady state three-dimensional thermal conductive field induced in a metallic finite solid by a Gaussian moving laser beam is carried out using a finite volume numerical technique. The numerical simulation allows for both surface heat losses, convective and radiative, and variable thermophysical properties. The convective heat transfer on the outer surface of the solid is taken into account in order to simulate an impinging circular jet. This approach is suitable for any Peclet number value. The

thermophysical properties of the solid are temperature dependent and radiative and convective heat losses, the latter due to an impinging gas jet on the upper surface, have been taken into account. Results in terms of dimensionless temperature profiles are reported in order to allow evaluating the main differences between heating with and without surface radiation and gas jet.

SIMULATION AND MODELING OF CONVECTION HEAT TRANSFER, DURING ELECTRIC ARC WELDING UNDER GAS PROTECTION

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Lenuța SUCIU, Constantin MARTA, Iancu TĂTUCU, Dorian NEDELCU

Key words: optimization, cupola, charge, Simplex algorithm

Abstract: Calculation method of convection heat transfer coefficient, for electric arc welding under carbon dioxide protection atmosphere is presented in this paper.

EVALUATION OF DENSIFICATION MECHANISM BY HOT ISOSTATIC PRESSING DURING NABARRO HERRING AND COBLE CREEP

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Virgil GEAMĂN, Mariana AXENTE

Key words: HIP, compression mechanism, full density.

Abstract: Hot isostatic compression(HIP) involves the simultaneous application of pressure and elevated temperature to materials. Under these conditions of heat and pressure, internal pores or defects within a solid body or a powder compact collapse and weld up. HIPing 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. The main densification mechanisms during hot isostatic pressing are: plastic yielding, power law creep, densification by diffusion and Nabarro-Herring and Coble Creep. The paper presents some theoretical data for calculating densification

mechanisms during Nabarro-Herring and Coble Creep.

TECHNIQUES FOR INTENSIFYING HEAT TRANSFER, FROM BASICS TO NANOFLUIDS

.....22

Alina Adriana MINEA, Oronzio MANCA

Key words: heat transfer, nanofluids, convection, boundary condition, Nusselt number, Reynolds number.

Abstract: Some of the important considerations that arise when dealing with the thermal transport in the processing of materials make the mathematical and numerical modeling of the process and the associated system for materials processing very involved and challenging. Special procedures and techniques are generally needed to satisfactorily simulate the relevant boundary conditions and material property variations, as a part of heat transfer application. Enhancement techniques essentially reduce the thermal resistance in conventional industrial heating equipment by promoting higher convective heat transfer coefficient with or without surface area increases. Nanofluids are conventional heat transfer liquids, such as water or glycol mixtures, which contain a small volume fraction of suspended nanoparticles in a colloidal solution. Numerous experiments on the static thermal conductivity of these fluids have revealed a greater-than-expected effective thermal conductivity, and thus there is great interest in utilizing nanofluids for heat transfer applications. For electronic packaging, their thermal performance under convective heat transfer conditions is of greatest interest. Therefore, here is reported a critical review of the limited existing data on convective heat transfer with nanofluids. The results indicate higher Nusselt numbers than those predicted from analytical expressions at low Reynolds numbers, or by the Dittus-Boelter correlation at higher Reynolds numbers.

COEFFICIENT OF THERMAL CONDUCTIVITY FOR GREEN MOULDS WITH BENTONITE AND CLAY

THE MODERN COMPANY MANAGEMENT AND POSSIBILITIES FOR UTILIZATION OF COST INFORMATION

.....41

Gheorghe V. Lepadatu

Key words: cost, managerial accountancy, fixed cost, variable cost.

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Ioan CIOBANU, Sorin Ioan MUNTEANU, Aurel CRIȘAN, Vlad MONESCU, Vasile JIMAN, Mihai CHISAMERA, Ioan MĂRGINEANU

Key words: solidification, casting, mould, thermal analysis, grey iron.

Abstract: The paper presents the results of experimental research regarding determination of the substitutive thermal conductivity coefficient of green moulds made from silica sands with bentonite and clay. The time related variation curves of temperature were determined for certain points of a cast part and of the casting mould. The experimental curves were compared to the cooling curves determined by computer simulation of the solidification of the same parts. Solidification was simulated for castings including cast iron plates with a = 20 mm wall thickness. Several successive simulations were carried out for different values of the substitutive thermal conductivity coefficient, until the real solidification time of the casting, experimentally determined by advanced thermal analysis, corresponded with the solidification time obtained by simulation.

MAXIMAL DEFORMATION CALCULATION OF SHELL-TYPE PATTERNS USING MATLAB SOFTWARE

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Mihai Alin POP, Diana Elena APOSTU, Alexandru CONSTANTINESCU

Key words: moulding, cave patterns, deformation.

Abstract: In order to analyse the thin-walled cave patterns behaviour during moulding process, several tests were performed, using static loading, during machine compressed moulding and impact – compressed moulding and for measuring the deformation occurred. Is trying to determine the deformation size of cave pattern using MATLAB software, deformation that occur during complex training operation.

ECONOMICAL MANAGEMENT

Abstract: Cost information have to be considered as instrument for value creation under low cost. This aspect show the cost information system capability to supply relevant informations for several purposes such as utility in financial accountancy (procurement cost, production cost, complete cost, dispatch cost and period cost); utility in making decisions (opportunity

cost, relevant cost, irreversible cost); performance management (hidden costs, controlled costs, externalised costs).

IMPACT OF FISCAL REGULATION ON SMALL AND MIDDLE SIZE ENTERPRISES SECTOR, UNDER FISCAL COMPETITIVENESS

.....46
Mariana VUȚĂ, Nicoleta VINTILĂ, Paula LAZĂR, Mihai VUȚĂ

Key words: small and middle size enterprises, fiscal regulation, economic performance, fiscal policy.

Abstract: Creation and development of international trade of capital markets, elimination of commercial barriers, opening of labour force market, generated the effect of globalization and mondialisation of economic and financial activities. Under these condition the international economy performed significant annual growth, except year 2008, when inflation rate growth and unemployment rate growth created crisis phenomena. The State can influence the activities performed in the small and middle size enterprises, implementing adequate fiscal policies. In Romania existing fiscal policies generated controversial situations affecting small and middle size enterprises.

ADVANCED METHODS FOR SIMULATION AND DESIGNING COMPUTER ASSISTED (FOR STAMPS AND DIES)

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Cezarina Adina TOFAN

Key words: stamp, dies, designing, costs, expenses.

Abstract: The specialists think when a product leaves the compartment of the project there are established

almost 70% from the all spending for its making. So, during the projection, the base cost can be determined and it can be changed with difficulty. For reducing those costs involves a lot of time and effort. The development of CAD technique (Computer Aided Design) and CAE (Computer Aided Engineering) creates new possibilities for an important integration of reliability from the projection process of stamps and dies.

RETESTING OF FELDSTEIN-HORIOKA

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Doinița CIOCÎRLAN, Ioana DUCA, Rodica GHERGHINA, Aurelia ȘTEFĂNESCU

Key words: integration of financial markets, national economies, capitals mobility.

Abstract: Globalisation of financial markets represents a trend which has to be connected to the other economic processes existing at world wide level: growth of interdependences between different countries, international trade dynamics, expansion of multinational companies, regional integration and growth of institutionalisation of financial activities at world wide level. Several indicators are utilised for measuring of globalisation trends of financial markets, such as: degree of financial opening, degree of financial integration and degree of financial action. The Feldstein-Harioka model represents one of quantitative indicators for measuring the financial integration. A cross-section analysis has been made for 22 countries, members of OCDE for 1987-2005 period. The results confirm a growth of financial markets integration degree in these countries.

ENVIRONMENTAL ISSUES

POLLUTION OF SLATINA INDUSTRIAL PLATFORM (NONFERROUS METALS AND ALLOYS)

.....62
Cristiana GLAVCE, Laura JIJAESCU

Key words: pollution, environmental factors, population health status.

Abstract: The atmosphere quality is considered the most important for monitoring of environment factors, being the

most unpredictable vector of pollution propagation, with important effects on human beings and other environmental components. Direct effects are represented by annual modification of CMA, which represents the status of population health in this area. These modifications are represented by growth of morbidity, physiopathological and physiological direct modifications, human body being attacked by pollutants.