ABSTRACTS

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ALTERNATIVE APPLICATIONS OF PELTIER THERMOPILES IN COOLING METAL HYDRIDE CONTAINERS

(pages 73-80)

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Keywords: Peltier thermopile, cooling, metal hydride container, absorption, hydrogen
Abstract: Hydrogen absorption into a metal hydride container is accompanied with generation of heat that must be removed during the process. In the case that the container is not cooled, the gas pressure rapidly increases and even with a small amount of stored hydrogen it exceeds the permissible value. Peltier thermopiles offer an interesting alternative to conventional cooling methods and they have been increasingly used. The present article describes the measurements aimed at identification of an optimal cooling method and the results of the comparison of surface cooling, circulation cooling, and the combined cooling methods in terms of thermodynamic and energy parameters during hydrogen absorption.

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PER OPERATION OF THE AUTOMATIC HEAT SOURCE ON PELLETS WITH VARIOUS BURNER TYPES

(pages 81-85)

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Keywords: heat source, wood pellets, burner, biomass, boiler
Abstract: One of the most important issues in choosing a heating system is the question: What kind of fuel can be burned in given heating system. Modern automatic solid fuel boilers are often specialized only on a narrow range of suitable pellet materials. Pellets from cheaper sources are also beginning to appear on the market. However, many burners are unable to burn these new types of pellets without significant burning problems. The article deals with the influence of the proper construction of the burner on the smoothness of the combustion process and the smooth operation of the combustion equipment. The results of the experiments document the continuity of the combustion plant in the combustion of less quality pellets containing bark using more modern combustion technologies. In fact, less quality pellets cause the formation of ash sinters which cause the continuous combustion process to be interrupted, resulting in fluctuations in equipment performance and the onset of thermal discomfort. The results showed no problem with burning even when making sinters, but also showed a fluctuation in performance and the need for manual control, especially when heating or clogging the supply pipe. They also showed significant damage to pellets in the worm feeder section. These problems, therefore, ultimately require further research to ensure complete, seamless operation.

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PERFORMANCE POTENTIAL OF HEAT PUMP DRYING CYCLES

(pages 87-92)

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Keywords: heat pump, drying, drying rate, energy efficiency
Abstract: There are two thermodynamic models of the closed and vented heat pump drying process described in the paper. The models have been used for optimization of process design parameters with respect to drying rate and energy efficiency, respectively. The optimization was performed in points of parametric space defined by refrigerant and air flow rates. Results of the optimization shows the same maximal drying rate performance for closed cycle and both objective functions. There is higher potential of drying time reduction for vented cycle in comparison to closed cycle. Results of the optimization showed strong correlation of the MER parameter with refrigerant flow rate for both closed and vented heat pump drying cycle. There is same maximal MER value obtained for both MER and SMER optimized cycle parameters.

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EVALUATION METHODS OF BONE CONDITION

(pages 93-96)

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Keywords: osteoporosis, dual energy X-ray absorptiometry, quantitative ultrasound, single energy X-ray absorptiometry, quantitative computed tomography
Abstract: The article presents research methods for bone damage diagnosis by osteoporosis. We describe in detail densitometric methods such as DEXA tests, SXA method, Quantitative Computed Tomography (QCT) and Quantitative UltraSound (QUS) method. In this article we evaluated to problems concerning in diagnosis and the availability of diagnostic equipments.

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MOTION ANALYSIS OF POINT OF A SIMPLE MECHANISM

(pages 97-102)

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Keywords: kinematics, analytical solution, numerical solution, simulation
Abstract: This article deals with motion analysis of point of a simple mechanism executing a rotational movement. We analysed the movement of its end points. The trajectories of points is cardioids. Numerical solution was implemented by classical kinematics using different coordinate systems, while model mechanism has been also modelled and solved in the program MSC ADAMS View.

ABSTRACTS

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SUPPLIER PLANNING WITH ANALYTICAL HIERARCHY PROCESS

(pages 103-107)

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Keywords: multiple criteria decision-making, Analytic Hierarchy Process AHP, supplier selection
Abstract: The aim of this paper is to select the optimal supplier for new equipment according to clients' selected criteria using the analytic hierarchy process (AHP). This paper is composed of a theoretical part, which constitutes a detailed methodology of the AHP an application part, in which the described method is put into practical use for ranking alternatives, the selection of the optimal supplier for a production improvement. The results of the application part are summarized in the conclusion.

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VIRTUAL PRODUCTION TECHNOLOGY VS. ENVIRONMENT

(pages 109-114)

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Keywords: robot, virtual, workplace, animation
Abstract: Specialized robotic workplaces or systems are not only a complex issue, but at the same time they are financially demanding in the field of production, especially, when the prototypes essential for mechanical engineering or forestry are concerned. Such a robotic workplace calls for an original project of a small series production and the proposed virtual environment meets the requirements for the verification of the technological properties, reliability and construct possibilities of the prototypes. The specialized robotic workplace is an interactively described 3D object and is programmable in accordance with the real environment requirements. Virtual technologies represent a convenient solution for the preparation of a safe ergonomic, economic and environmental workplace.