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MODERN TECHNOLOGICAL ALTERNATIVE FOR OBTAINING ECOLOGICAL ENERGY – EQUIPMENT FOR RECYCLING OF THE ORGANIC WASTES IN AGRICULTURE

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This article presents a modern technological alternative for obtaining ecological energy – equipment for recycling of the organic wastes in agriculture. It is presented a cost-benefits analysis which must be carried to prioritize rural agricultural project with a higher return on the use of solid organic wastes.

SOME ASPECTS REGARDING THE AUTOMOTIVE TRANSPORT EVOLUTION AND THE NECESSITY TO REDUCE THE IMPACT TO ENVIRONMENT

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The paper presents some aspects regarding the development of the automotive road in the world and the implication over the environment and the full resources. Also is shown the necessity for the manufacturer to find new technical solution including the new technology. Finally, is presented the new romanian research regarding the regenerative the braking energy of the automotive vehicle in the frame of one CEEX project, which is made by a consortiu represented by the author.

MODERN ECOLOGICAL SOLUTIONS FOR GRANULAR COMPOUNDS DETACHMENT

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Electrostatical detachment method represents an ecological alternative for granular compounds separation. This technology had a large distribution in waste products recycling industry, in order to obtain the metal separation against the nonconductive materials contained in granular compounds. The purpose of this paper is to present the separation method, the experimental installation and obtained results. Final conclusion lead on the idea that the separation method for copper, aluminium and nonconductive materials represent a modern ecological sollution for environment preservation, having cleary implications in waste recovery processus.

ENVIRONMENT POLUTION LIMITATION BY USING ECOLOGICAL COMBUSTIBLES

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In this paperwork are presented the advantages and disadvantages of replacing traditional energy sources, based on crude oil, coal and natural gas with regenerable sources, like ecological combustibles. There are presented general aspects concerning biomass and main actual technologies applied worldwide for transforming it: direct burning, gasification, pyrolise, biological anaerobic fermentation. Among biocombustibles obtained in processes that transform biomass in more useful intermediary energy forms are presented the bioethanol (obtained by alcoholic fermentation of grains and fruits) and the biodiesel (obtained from oils of rape, sunflower, soya beans and corn).

A NEW DEVELOPMENT IN BIOMASS GASIFYING TECHNOLOGY

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New development of biomass and organic waste gasifying technology witch distinguish from the other modern technologies by:

- *discontinuous, short sequences, high speed biomass injection, carried out by strong, right controlled volume of compressed gas pulses and high speed heating of the biomass into burning cyclone and burning sand gravel.*
- *currently, the carrying gas is compressed air. Also, the gravel bed there is in slow, controlled, linear movement, that carries out the ash. The own moisture of biomass supports a part of the reaction steam.*

CLEAN TECHNOLOGIES CONCERNING CELLULOSE WASTE MANAGEMENT, IN PERSPECTIVE OF SUSTAINABLE DEVELOPMENT STRATEGY, ACCORDING TO U.E. PREVISIONS AND REGULATIONS

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Implementation of new "clean technologies" by waste management gives a reduction of negative impact of the economical activity over environment. These are imposed conditions concerning the alignment of Romania to the ecologic requirements toward EU environmental standards. It is also a necessity the accomplishment of Romanian assumed engagements in the bargaining process of Chapter 22 from Community Acquis, which impose total removal advertisement of wastes. In ICTCM there were accomplised equipments for recovery – reusing – revaluation (RRR) of different wastes categories: wood wastes: husks, branches, wood chips, sawdust, wood shavings, pasteboards and paper wastes.

AN ADVANCED MATERIAL MODEL IN THE SIMULATION OF A HYDROFORMING PROCESS

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The paper presents the use of a new yield criterion for the mechanical modelling and numerical simulation of the hydroforming processes. The new criterion is derived from the one proposed by Barlat and Lian in 1989. In order to obtain a better representation of the plastic behaviour of the orthotropic sheet metals, two additional parameters have been included in the expression of the equivalent stress. An augmented lagrangean finite element model of the hydroforming processes has been developed and implemented into an original computer programme. The results of the numerical simulations have been compared with data published in the literature.

RESEARCH AND DEVELOPMENT OF BREAKING UP - DISAGGREGATING EQUIPMENTS FOR WOOD MATERIAL OBTAINED FROM THE ADJUSTEMENT OF TREES FROM ALLEYS, GARDENS AND FORESTER AREALS, IN ORDER TO OBTAIN ECOLOGICAL VEGETAL COMPOST

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Paper presents the R - D activities developed in a CEEX project – AGRAL Programme, which are made by a consortium between INOE 2000-IHP, ICTCM, INCDMF, UPB-CCEPM and ROMFLUID. The project's purpose is to achieve a machines system which must do a mechanized process for wood –waste, vegetal – waste. These wastes results from the adjustement / cutting of trees from different agricultural, fruit-growing and forester areals, in order to obtain ecological vegetal compost. Thie one is used to develop an ecological agriculture, with medium favourable effects and also for the biomass achievement, in order to obtain regenerated fuel.
Project fills INOE 2000-IHP researches, because it has also a research project on MENER Programme which is about an equipment for preparation the vegetal waste compost. This equipment is complementary to the first one and it is in an advanced accomplishment stage.

STUDY OF THE PROCESSING BY HEAT TREATMENTS OF BIMETALLIC BUSHINGS FOR AUTOMOBILES

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The heat treatment of the bimetallic bushings of the automobiles must be seen as a compromise that satisfy the requirements both of the base material MB (hypoeutectoid carbon steel) and of the deposited layer SD (bronze with aluminium) regarding the framing in the temperatures range in which the phase transformations take place. Conforming to the phase equilibrium diagram, the bronze layers deposited present a variation of the solubility with the temperature, which involves the possibility of the modification of the physical-mechanical properties by heat treatments. The heat

treatments applied to the bimetallic assembly hypoeutectoid carbon steel – bronze with aluminium can be the salt hardening, the aging and the homogenization annealing.

TECHNICAL -ECONOMICAL ASPECTS REGARDING THE PRODUCTION OF A MECHANICAL MANIPULATOR FOR PRESSING EQUIPMENT

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The paper presents the technical-economical analysis for a mechanical manipulator used to the pressing equipment. This unit can be used any time and any place without installation and it is an ideal tool for handling, positioning, assembly, and feeding operations. The main benefits of the equipment are: increase safety and worker productivity by automatically feeding instead of the worker, reduce costs in labor.

STRUCTURAL OPTIMIZATION BY SENSITIVITY APROACH IN COSMOS/M

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In this paperwork are presented a series of theoretical notions regarding elements of sensitivity in optimization analysis of spatial structures. First are presented briefly the basic notions of design optimization, such as Design variables, Objective function, and Behavior constraints, and what they can be in COSMOS/M. Then is presented the notion of Sensitivity in relation with optimization analysis and the sensitivity types in COSMOS/M: global sensitivity, offset sensitivity, local sensitivity, or optimization sensitivity results, and finally conclusions regarding using sensitivity analysis prior optimization analysis

ECONOMIC ASPECTS OF THE BIMETALLIC BUSHINGS

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In the context of the integration of Romania in the EU the production increase and the utilization of the bimetallic products is expected in different fields due to the improvement of the electric, thermal, anti-friction properties, the improvement of the sticking, adherence possibilities, saving of the non-ferrous materials. The actual research in the field of bimetals hints at the gradual increase of the geometrical dimensions of the bimetallic bushings, the diversification of the assortments of the base materials and deposited layers in the direction of the increase of alloying degree, development of the automation and robot utilization for the deposition of the metallic layers. Savings of metals and critical alloys rich up to 90% in the case of the utilization of bimetallic half-products in the manufacture of apparatus with a high degree of incorporated intelligence.

FRICTION PROCESS AND FRICTION COUPLES, IN TRIBOLOGICAL CONDITIONS

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The paper presents researches concerning the friction process and friction couples in tribological conditions, analysing the contact between the friction surfaces in relative mouvement and the friction couples.

MINIMISING REMANENT STRESS IN THERMAL SPRAYING DEPOSITIONS

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The paper presents several attempts to minimise remanent stress in various electric arc thermal spraying depositions by means of shot peening. There are presented the origin and the classification of remanent stress , the remanent stress in thermal spraying deposition layers, the measurement of remanent stress in the depositions carried out by thermal spraying,the minimisation of remanent stress in thermal spraying deposition and the conditions of minimising speed of remanent stress and compacting deposition layer through thermal spraying.

THE FLOW OF POWDER AND GRANULAR MATERIALS FROM STORAGE BINS (I)

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The paper presents the main rheological characteristics defining the behaviour of powder and granular materials in different equipments (for stockage, transport, handling and processing).

THE FLOW OF POWDER AND GRANULAR MATERIALS FROM STORAGE BINS (II)

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Based on the rheological characteristics presented in the part I of this paper, a method has been derived concerning the determination of the parameters regardind the flowing of powder and granular materials from bins (the dimension of the bin gate for which the arching process does not take place ; the pressure exercised by the material against the shutter; the velocity of flow). The presented example confirms the proposed calculating method.*

STRESS STATES IN DISCHARGE AREAS OF WORKING MEDIUM FROM HEATING / COOLING JACKETS CONTAINERS (I)

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The paper deals with the study concerning the concentration of stress in the area of discharge of products from vessels with dished bottom (ellipsoidal, spherical, basket handle) in the condition of the existence of an cylindrical spill nozzle and when the heating (cooling) jacket is fixed to the vessel body through a cylindrical section (constructional version A). The analysis of the state of loading is made taking into consideration the elastic range of construction materials and the use of short structural elements method, respective the effects superposition of external (pressure, thermal gradients) and internal loads (binding loads). Accepting the continuity of radial- and angle of shearing-deformations, the set of equations allows to establish the expressions of binding loads (shearing force and bending moments), before the evaluation of the plane stress and the reevaluation of the structure's geometry, respective of the construction materials, in the conditions imposed by the process technology.

CONTRIBUTIONS TO STRENGTH CALCULUS FOR THE MIXING DEVICES ROTATING SHAFTS

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The paper is the following of a study accomplished in order to compare the results obtained by practical application of two strength calculus methods for the mixing devices rotating shafts. It is about the classical method and a new one, respectively, based on critical energy principle. There are presented two concrete cases: one shaft, without seal, under accidental loading and a shaft under normal loading, with seal.