

## **1. APPROXIMATE METHOD IN ORDER TO DETERMINE THE DISPLACEMENT FIELDS FOR THE KINEMATIC ELEMENTS STANDING IN VIBRATION (pp. 1 – 6)**

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**Abstract:** First of all, using the mechanical model with four concentrated masses, the mathematical model of vibrations in case of a linear-elastic connecting rod, part of a parallelogram mechanism, is presented. Afterwards, the cross displacement field is determined. The knowledge of displacement fields as a result of the vibrations for the kinematic elements is a preceding stage for the determination of the stress and strain states, useful in machines designing.

**Keywords:** kinematic elements, vibrations, mathematical model.

## **2. PRECISION GENERATION PATHS A LINEAR IN THE CASE OF INDUSTRIAL ROBOTS (pp. 7 – 14)**

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**Abstract:** The position of generating a linear paths in the case of Industrial Robots. Cinematic precision in many applications of industrial robots is a good choice criterion for a mechanical structure, which can be a constructive solution for compact and modular. In the chase mechanical modular structure, precision cinematic may be a criterion for the choice of modules of a RI. In the present paper, the error couples cinematic an industrial robot, is presented accurately create a traectorie linear structures robots TRR and TTR. Be aware of the errors of modules or mechanical structures can easily choose from a computer module or corresponding structures of some sets of mechanical modules or existing structures which satisfy the precision balls to generate a linear paths.

## **3. FINITE ELEMENT ANALYSIS IN STATIC REGIME OF AN ENDO-PROSTHETIC SYSTEM USED IN HUMAN ANKLE JOINT ARTROPLASTY (pp. 15 – 24)**

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**Abstract:** In this paper is presented the finite element analysis achievement of an endo-prosthetic system (implant) used in ankle joint disarticulation from the human lower limb structure. The paper is structured in three parts, so in first part are exposed the main causes which motivate the endo-prosthetic system implant through a surgical procedure called artroplasty, as well as the main types of implants used in the sight of ankle joint disarticulation from the osteoarticular system structure of human lower limb. In the second part of the paper is described the obtaining method of the interest bony virtual models (tibia, fibula, talus), and the endo-prosthetic virtual model used in ankle joint disarticulation. Based on the obtained virtual model, it is performed a finite element analysis of the whole system, obtaining as results: stress, displacements and deformations of this, with the von Misses algorithm, the results and the obtaining method in accordance with the proper loads applied to the virtual model in critical situations, are presented in the third part of the paper.

**Keywords:** artroplasty, finite elements, talo-crural joint, virtual model.

## **4. RECYCLING PLASTICS IN THE AUTO INDUSTRY (pp. 25 – 32)**

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**Abstract:** Considering how important the plastics in the modern auto industry are, the paper presents the basic principles of the plastics recycling management and some fields of applicability of the recycled materials.

**Keywords:** plastics, autos, recycling

## **5. USE OF LPG INSTALLATIONS ON OTTO ENGINES AND LPG CONTROL UNIT CALIBRATION TO REDUCING THE CO<sub>2</sub> EMISSIONS (pp. 33 – 41)**

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**Abstract:** In this article, the authors present the results of a study made to reveal the reduction of CO<sub>2</sub> emissions by using LPG (Liquefied Petroleum Gas) to the Otto engines, as well as the calibration of LPG control unit for showing the potential of reducing the CO<sub>2</sub> emissions by using LPG installation. The test had been made on a vehicle with an engine with 0.8-liter cylindrical capacity, equipped with sequential LPG installation. In first place, has been measured emission running the engine with gasoline, and then running with LPG to point out the reduction of CO<sub>2</sub> emissions. After that we made the LPG control unit calibration to obtain a lower level of CO<sub>2</sub> emissions. The other pollutant remains under the level of pollution standards Euro 4. Because the price of LPG is chipper compared with gasoline, this type of installation has spread more and more, needing a greater attention in order to obtain a higher efficiency, better emissions levels and more power delivery from the engine.

**Keywords:** CO<sub>2</sub> emissions, LPG, calibration.

## **6. EXPERIMENTALLY RESULTS ABOUT THE VIBRATIONS OF A LINEAR VISCOELASTIC CINEMATIC ELEMENT OF CRANK AND CONNECTING ROD ASSEMBLY WORKING AT LOW SPEEDS (pp. 42 – 48)**

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**Abstract:** This work presents the vibrational displacements for a viscoelastic cinematic element of crank and connecting rod assembly working at lower speeds. The movement equations of the linear-elastic straight kinematic elements in plan-parallel motion are presented by using the hamilton's variational principle. Finally, for a concrete case, the plotting of the displacements are given in theoretical and experimental way.

**Keywords:** viscoelastic material, spectral analysis, acceleration of vibration, crank and connecting rod assembly.

## **7. MEASURES TO INCREASE THE OUTPUT OF A POWER AND THERMAL POWER PLANT OF 120/150 MW WITH ITS FRAMING IN THE ENVIRONMENT REQUIREMENTS (pp. 49 – 62)**

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**Abstract:** In the energetic field the concerns regarding the settle of optimum level in producing the electric power (EE) and thermal energy (ET) imply to cover the following stages: to collect and to process the information regarding the behaviour of energetic equipment, to set the criteria of the energetic equipment optimization, to evaluate the terms of objective function, to set the optimum solution.

## **8. RESEARCH REGARDING THE ROUGHNESS OF THE SURFACES TITANIUM ALLOYS GRINDING (pp. 63 – 68)**

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**Abstract:** This paper presents the results of some experimental research regarding the roughness of the surfaces for titanium alloys: TiAl6V4 in the case of the grinding process.

**Keywords:** Titanium alloys, grinding, roughness surfaces, non linear functions, analysis regression.

## **9. THE KINETICS ARTESIAN WELLS – SOURCES FOR THE ENVIRONMENT IMPROVING (pp. 69 – 76)**

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**Abstract:** The paper presents generated mechanisms of cycloidal curves used in artesian wells. The kinetics artesian wells offer a friendly human environment and improve the air quality.

**Keywords:** Environment improving, artesian wells, mechanism

## **10. CONCEPTS TO INCREASE THE ENERGETIC EFFICIENCY IN POWER PLANTS BY THE ANALYSIS OF A REAL ENERGETIC BALANCE AND THE PASSING TO AN OPTIMIZED ENERGETIC BALANCE (pp. 77 – 96)**

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**Abstract:** This paper deals with the increase of energetic efficiency in thermal power plants (TPP) and electric heating plants (EPP) by the analysis of a real energetic balance and the passing to an optimized energetic balance. An essential and main component part in achieving a real energetic balance is the optimization of reliability level in power plants (PP). In thermoenergetics the concerns regarding the settle of the reliability optimum level in customers supply with electric power (EE) and thermal energy (ET) imply to cover the following stages: to collect and to process the information regarding the energetic equipment behaviour, to establish the criteria of reliability level optimization, to evaluate the objective function terms, to set and to apply the optimum solution. The authors original contribution includes the implementation of a Programmes Package which assures the data collection, transmission and analysis and the effective achievement of a centralized management in order to draw up a real energetic balance and the passing to an optimized energetic balance.

## **11. RESULTS OBTAINED OF THE KINETIC ARTESIAN WELLS SIMULATION, CONSIDERED LIKE SOURCES FOR THE ENVIRONMENT IMPROVING (pp. 97 – 104)**

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## **12. THE MATHEMATICAL CHARACTERISTIC OF THE AXIAL PUMPS (pp. 105 – 114)**

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**Abstract:** In the paper are presented the similitude criterions of volumetric pumps determined by theorem. In the mathematical model of the axial pumps in laminary and turbulent regime.

## **13. HIGH PRESSURE CELL FOR ISOSTATIC PRESSING OF CERAMIC POWDERS (pp. 115 – 122)**

Constantin DUMITRU<sup>1</sup>, Cristina Violeta DUMITRU<sup>2</sup>

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**Abstract:** The paper deals with some theoretical aspects of high pressures, the experimental problems and of industrial practiced linked with this range. It shows the construction, the working manner and the performances of a high pressure cell destined for powders isostatic pressing as well as the conclusions derived from the tests. Also, concrete and efficient solutions are presented for an industrial equipment designing. It ensures the follow performance: equivalent diameters scale, between 20-150 mm, with the ratio  $D/L \leq 1$ ; isostatic pressure, between 100-300 Mpa.

#### **14. RESEARCHES REGARDING THE LINEAR AND ANGULAR DEFORMATIONS OF THE SHAFTS OF THE CENTERLESS GRINDING MACHINES (pp. 123 – 134)**

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**Abstract:** In paper it is presented a method for calculating of linear and angular deformations of the abrasive disk shafts of the finishing machines centerless with transversal advance.

**Keywords:** deformations, centerless machines, forces, solicitations, distortions

#### **15. GENERATION OF PLANE SURFACES USING CYCLOID CURVES ON TURNING MACHINES (pp. 135 – 146)**

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**Abstract:** The paper presents the background consideration which allows machining of plane surfaces on turning machines, using the main feed movement. At this procedure are established the basic principles of an external device, that can be attached to the machine, in order to generate a plane surface.

**Keywords:** Cycloids curves, turning machine

#### **16. STANDPOINTS ABOUT THE MANAGEMENT OF POWDER PRODUCTS DESIGN (pp. 147 – 154)**

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**Abstract:** In this paper the engineering design process is defined and the Product Design Specification is detailed. Subjects covered include form design, design for manufacture and assembly, materials and process for powder products selection. In general the simplest solution is the best and all professional engineers seek elegant and simple solutions. Design is not solely the achieving of technical solutions but also creating useful products which satisfy and appeal to their users. So along with the engineering science knowledge used the importance of communication, teamwork and project management cannot be underestimated.

**Keywords:** Powder metallurgy products, form design, project management.

#### **17. STUDIES REGARDING HARDNESS AND IMPACT ENERGY OF SOME SINTERED FE-CU ANTIFRICTION MATERIALS (pp. 155 – 160)**

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**Abstract:** In this study the effect of different alloying contents including tin and lead on the hardness and impact energy of the sintered iron – copper based alloys was investigated. The impact strength has a different variation with lead and tin contents. Also, hardness decreases as the tin contents is diminished and lead contents is grown.

**Keywords:** antifriction material, density, hardness, impact energy

#### **18. THE EFFECT ON THE HUMAN BODY OF THE NOISE PRODUCED IN A METAL CONSTRUCTIONS HALL (pp. 161 – 166)**

*Mihaela-Liana BOGDAN<sup>1</sup>, Ileana Cristina PASCUI<sup>2</sup>, Daniela-Doina VINTILĂ<sup>3</sup>*

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**Abstract:** In this paper there are presented the operations that take place in a metal constructions hall, considered as noise factor. There are analysed the noises produced in the metal constructions hall, with different amplitudes, frequencies and periods. Also, it is analysed the effect of the number of noise sources on the human body. It is determined the relation between the frequency and the amplitude of the sound. In order to establish the degree of influence of the noise on the human body, there are presented noise limit curves for different working places. The noises produced in the metal constructions hall are analysed in order to fit in the limits given by the noise limit curves established by the World Health Organisation. In order to reduce the noises produced by the noise sources in a metal constructions hall, and implicitly their effect on the human body, there are suggested several solutions.

#### **19. NEW MATERIALS FOR EXHAUST GAS SYSTEM AT DIESEL ENGINE (pp. 167 – 172)**

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**Abstract:** Modern diesel particulate filter systems achieve a significant reduction in emissions. Silicon-bonded silicon carbide particulate filters play an important role in this application, as they provide the necessary flexibility in terms of mean pore size, porosity and cell density to meet emission targets for 2005 and beyond.

**Keywords:** filter; exhaust gas; emissions.

#### **20. THE ANALYSIS OF THERMIC PHENOMENA WITH TECHNICAL PLANTS AND GRAIN SEEDS DRYING (pp. 173 – 184)**

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**Abstract:** This paper analyzes the thermic phenomena during the process of drying technical plants and grain seeds using equipment with double heating source: electrothermic and solar.

**Keywords:** drying, energy, solar, seeds, temperature, humidity.

#### **21. TENSILE STRENGTH AND COMPRESSION RESISTANCE OF SOME PM IRON BASE MATERIALS (pp. 185 – 190)**

*Cristina TEIȘANU<sup>1</sup>, Ștefan GHEORGHE<sup>2</sup>, Ion CIUPITU<sup>3</sup>*

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**Abstract:** This paper describes the effect of different alloying contents including tin and lead on the tensile strength and compression resistance of some sintered iron – copper based alloys. Tensile and compression tests were used to determine the mechanical behaviour of the selected alloys. Tensile strength and compression resistance are reduced with the increasing of the lead contents and decreasing of the tin contents.

**Keywords:** PM iron base material, density, tensile strength, compression resistance.

#### **22. SOFTWARE FOR MECHANICAL SYSTEMS MODAL IDENTIFICATION (pp. 191 – 198)**

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**Abstract:** The paper presents the theoretical background of the modal identification and package programs software realized by author for modal parameters identification of the mechanical systems. At the end of the paper it is presented an experiment for modal parameters assessment of a lamella realized in composite materials.

**Keywords:** modal identification, modal parameters, eigenmodes, eigenvectors.

### **23. RESEARCHES ABOUT AIR POLLUTION MADE BY AUTO VEHICLES IN TARGU JIU (pp. 199 – 204)**

*Roxana POPA<sup>1</sup>, Maria CALINOIU<sup>2</sup>*

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**Abstract:** The paper presents aspects about air pollution in the city of Tg-Jiu and the researches made to evaluate the pollution level. After monitoring the main pollutants (SO<sub>2</sub>, NO<sub>2</sub>, NH<sub>3</sub> and flying powders) it was proved that auto vehicles are the main air pollution source. A few solutions for reducing auto vehicles emissions are presented.

**Keywords:** pollution, auto vehicles, solutions.

### **24. HEAT RECOVERY FROM COOLING MACHINES, A WAY TO REDUCE ENERGY CONSUME (pp. 205 – 212)**

*Steluta DINU<sup>1</sup>, Luminita CUJBA<sup>2</sup>, Cristina VLASIE<sup>3</sup>, Gelu COMAN<sup>4</sup>*

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**Abstract:** This paper analyses the possibility of heat recovery from the refrigerating agent of overheated vapours after the compressor outlet. The survey has been carried out without modifying the functional parameters of the refrigeration plant (t<sub>0</sub>) and by varying values of the refrigeration power for each season necessity. In the summer time, the refrigerating plant is one hundred percent loaded and in the wintertime the load percentage is reduced for refrigerating and for recovering the heat a heat pump is utilised. It is made obvious the favourable influence of the necessary heat recovery in order to prepare hot water as a method of improving the exergetic efficiency of a cooling system. A study has been conducted on the specific water production that corresponds to the refrigerating power unit. This paper presents a comparative study regarding the importance of heat recovery, when using different couples of refrigerants, within a range of values of the ambient and condensation temperature. The study performed by computer is based on the use of equations for thermodynamic parameters of the surveyed refrigeration agents.

**Keywords:** overheated vapours, refrigerants, ammonia, recovery, exergetic efficiency

### **25. CONSIDERATIONS LOOKING THE CALCULUS OF MULTILAYER COMPOSITE FRAMES TO THERMAL SOLICITATIONS (pp. 213 – 218)**

*Gabriela Monica PANĂ*

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**Abstract:** The paper puts in evidence the particular problems set by the calculus of the composite frames through the method of the finite elements to thermal solicitations. Using of the multilayer model can represent the repartition of the temperature in each layer through linear approximations, conveniently simplifying the problem. This method permits, for anisotropic material, to take count of the component materials properties depending on temperature.

**Keywords:** thermal solicitations composite

### **26. THE STUDY CONCERNING THE USE OF THE SOLAR ENERGY AT THE INTERMITTENT ABSORPTION REFRIGERATING UNIT (pp. 219 – 224)**

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**Abstract:** The paper presents the modelling and simulation the boiling process of the vapours generator in a solar absorption refrigeration system in a non- stationary state. Solar radiation is the only energy source and it is used to increase the temperature of the NH<sub>3</sub> solution. The results of the model contain the time variation of the following parameters: concentration, and the solution mass, the mass of vapours resulted from dephlegmator the thermal power of the boiling and dephlegmator plants. The generator is the solar plan cylinder collector. The modelling is made for meteorological data from Galati.

**Keywords:** solar energy, Boiler, Generator, Solar collector

## **27. THE ANALYSES OF BIODIESEL SUCCES IN THE WOLRD (pp. 225 – 236)**

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**Abstract:** This article analyses critical technical areas that currently limit the success of biodiesel as a fuel. The production process is currently shifting from homogeneous to heterogeneous using solid catalysts for a cleaner process and ease of product separation. The free fatty acid and moisture contents in the raw materials must be sufficiently low to avoid soap formation. The production of biodiesel with full compliance with ASTM D6751-07 or EN 14214 is an uphill task. Current technologies for biodiesel production still do not provide more significant energy surplus. Biodiesel has relatively lower energy content, causing higher fuel consumption. Biodiesel has a drawback in terms of its cold flow properties. A high iodine value can cause degradation and polymerization of biodiesel components. Unconverted monoglyceride, diglyceride and triglyceride impurities will affect the engine performance. The alcohol content in biodiesel can attack rubber seals and gaskets. Biodiesel also can undergo chemical and biological modification to affect its quality in long-term storage. Biodiesel is also associated with high-level NO<sub>x</sub> emission, a fact that needs special attention.

**Keywords:** biodiesel, fuel, technical challenges, drawback, improvement;