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THE ALIGNMENT OF MANUFACTURING TECHNOLOGIES FOR METALLIC AUTOMOBILE COMPONENTS TO THE EUROPEAN ENVIRONMENT DIRECTIVES: DIR. 99/13/CE

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Making the technologies for machine components manufacturing to comply with the European Environment Directives: Dir. 99/13/CE is meant to assimilate the principles of the European Community industrial policy based on the amplification of the industrial competition based on competitiveness criteria under the conditions of strictly complying with the imposed environment demand.

The Romanian industry of machine components is more and more attractive for the foreign investors, a fact supported by the investment level during the last years, which strongly imposes the compliance of the technologies for the machine components manufacturing with the demands of the European Environment Directive: Dir. 99/13/CE.

EXPERIMENTAL RESEARCHES CONCERNING THE DETERMINATION OF FUNCTIONAL INDICATORS OF WORKING PROCESS FOR HARVESTING COMBINES

Eugenia Călin
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This paper presents the researches during the harvester thresher's experimentation. There are presented the necessary steps for the determination of the quality and quantity indicators of the self propelled harvester threshers working process concerning the combine harvesting and establish their performance. Paper presents the experimentation methodology, the tests and experimental data processing and the conclusions which results from these researches.

EXPERIMENTAL RESEARCHES CONCERNING THE INFLUENCE OF TOOTHING BEHAVIOR PARAMETERS ON GENERATED SURFACES QUALITY, WHICH ARE OBTAINED BY COLD SHOCK TOOTHING

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This paper presents the results from some experimental studies regarding cold plastic deformation by shock teething for OLC25 and OLC45 steel. There are presented the regression functions of the process for quality indexes R_a and R_z depending on the feed s_a and the deformation speed v_d .

CONSIDERATIONS CONCERNING THE TECHNOLOGIES FOR THE UTILIZATION OF METALLIC MATERIALS IN ASSEMBLY AND RECONDITIONING PROCESSES

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This paper presents the technical solution offer by using metallic materials into the assembly and reconditioning process and also, the advantages of their application.

„ASTRA” MUSEUM – PIONEER'S WORK IN INNOVATIVE ROMANIAN TECHNIQUE

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The paper presents the beginning of ASTRA museum history - the foundation of the „Muzeul Asociațiunii” in 1905, then another important moment - the beginning of the organization project of the first open in the air museum specialized in Romanian folk technical creation, in Dumbrava Sibiului (1960 - 1962). The Traditional Folk Civilization Museum “Astra” has now in its patrimonial compenence 127 monuments with over 350 constructios and 22.000 inventory objects, which are exposed on the 42 ha in Dumbrava Sibiului. These remerkable values of the „traditional technical patrimony” represent all roumanian zones from old times to our days. 2005 is the centenary aniversary year of the museum, being also marked by the international recognicion obtained by the inition and aprouvement of the UNESCO international price for “technical patrimony”, named “Dumbrava Sibiului” price.

**SERRATION PROCESSING
BY COLD ROLLING, WITH POSSIBILITIES
TO OBTAIN ON M.U.C.N.**

Ion Dobrescu, Ion Ungureanu
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This paper presents the advantages of the teeth processing by cold in comparison with the classic processing by cutting of them.

There are also presented the principals methods of cold rolling of teeth on tool machines equipped with numerical command and are put in evidence some types of them.

**THE ANALYSE OF FLEXIBLE MEMBRANE
FROM ELLASTIC COUPLING WITH
METALLIC ELEMENTS (MEMBRANE TYPE),
BY APPLYING FINIT ELEMENT METHOD**

Daniel Dobre, Andrei Dobre
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The paper presents the analysis of the elastic coupling with flexible membranes, taking into consideration the mechanical strength criterion in conditions of normal loading or torsion overload, with and without deviations, using finite element analysis, responding to multiple demands that are required in coupling construction. There are presented the basic principles about finite element method (the study of convergence at different mesh discretizations, the load scheme and boundary conditions for the flexible membrane). The analysis of strain and stress state of the metallic membrane is necessary to determine the maximum stress area in the membrane spokes.

**THE MODAL ANALYSIS OF FLEXIBLE
MEMBRANE FROM ELLASTIC COUPLING
WITH METALLIC ELEMENTS
(MEMBRANE TYPE)**

Daniel Dobre, Ionel Simion, Andrei Dobre
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The paper describes the modal analysis used to extract the natural frequencies and mode shapes of a flexible membrane. A membrane should be designed to produce natural frequencies that will prevent the coupling component from vibrating at one of its fundamental modes under operating conditions.

Model analysis is important as a precursor to any dynamic analysis because knowledge of the membrane's fundamental modes and frequencies can help to characterize its dynamic response and to decrease the amplitudes of the vibrations.

**THE DYNAMIC ANALYSIS
OF THE CYLINDER HEAD CLOSING
PLATE OF FUEL INJECTION ENGINE**

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The paper presents an attempt of the authors concerning the calculation of the maximum stresses for the cylinder head closing plate besides static case; a dynamic analysis was also performed in order to check out the possibility of resonance phenomenon occurring. The authors use FEM for calculus.

**DIMENSIONAL OPTIMIZATION OF
SPATIAL STRUCTURES (I) – MECHANICAL
PRESS BED PMCR 63**

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In this the paperwork is presented a method for structural optimization of spatial structures, applied to a mechanical press bed (PMCR 63 press). In this part of the paperwork are presented first theoretical background of method, then defining model for optimization, defining parameters for optimization, defining the objective function, defining optimization restrictions, and finally performing optimization with OPTSTAR, optimization module of COSMOS/M software. In the end are presented the result of optimization by analyzing the objective function (decrease of growth by dimensional optimization) in correlation with optimization restrictions.

**DIMENSIONAL OPTIMIZATION OF
SPATIAL STRUCTURES (II) –
MECHANICAL PRESS BED PMCR 63**

Cătălin Iancu
University „Constantin Brâncuși” Tg-Jiu,
ROMANIA

In this the paperwork is presented a method for structural optimization of spatial structures, applied to a mechanical press bed (PMCR 63 press). In this part of the paperwork is presented the analysis of design variables, respectively if they grows or decrease in optimization process. Then is presented the comparison of FEA analysis before and after the optimization process: stress analysis, displacement analysis and natural frequencies analysis (modal-

dynamic analysis). In the end are presented the conclusions resulting from optimization process, by analyzing the objective function (decrease of growth by dimensional optimization) in correlation with optimization restrictions, and with plate dimensions that can be obtained from various producers.

THE UTILIZATION OF CREATIVITY METHODS FOR A PRODUCT CONCEPTION

Nadia Belu, Daniel-Constantin Anghel
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At present, on the market increasingly competitive products oblige the companies to improve the methods used for products' realization. The products' design is a significant activity which can be improved by using creativity methods. These methods are specific to each phase of the design process. In this work we present application examples of these methods in a design experiment to evaluate the impact on his performances. The experiment was carried out at the Mechanics and Technological Faculty - University of Pitesti.

NUMERICAL SIMULATION OF MICROCLIMATE FROM CARS

Mariana Ivănescu, Ion Tabacu, Ștefan Tabacu
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In this paper, the authors are performing a complete analysis of the conditioning, ventilation and heating process in the case of a passenger's car.

Thus, a climatic analysis in 12 areas of the passenger's compartment introducing a numerical calculus of a ventilating system together with a passengers compartment simulation process.

The following parameters are used for the ventilating circuit: temperature, air absolute humidity and vaporizer flow rate.

The climatic analysis was performed by taking into consideration the heat transfer between the environment, the passenger's compartment and passengers.

In order to obtain the so called thermal comfort in the passenger's compartment, according to the conditions imposed by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers), the temperature must vary within the following range: $23 \pm 2^{\circ}\text{C}$ for the head area, $25 \pm 2^{\circ}\text{C}$ for the feet area, actually this being the reason for a 12 air areas analysis for the passenger's compartment.

THE STUDY OF THE PERFORMANCES OF PERMANENT COMPENSATORY COUPLINGS WITH METALLIC INTERMEDIARY ELEMENTS

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The paper specifies the place of the flexible metallic membrane coupling in metallic intermediary elements couplings area, depending on various parameters: nature of components, capability to handle installation misalignments, flexibility of metallic intermediary parts and the magnitude of torque transmission.

It is made a comparative study of functional parameters (maximum torque, maximum rotational speed and assumed deviations size) from which are found out conclusions about the advantages of flexible metallic membrane coupling use.

Are presented two couplings variants with and without intermediary spacer, with demand on internal market.

TRIAL AND TESTING OF ELASTIC COUPLING WITH FLEXIBLE MEMBRANES IN DYNAMIC REGIME

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The paper presents the role and the importance of homologation tests and experiments about vibrations behavior of the elastic coupling with flexible membranes, at all types of shafts deviations.

Starting from the flexible membranes functions and characteristics, are presented two dynamic test stands, designed to determine, in real conditions, if appear dangerous deformations in the spoke, after a certain test time.

Was analyzed the coupling behavior and the durability of the flexible membranes. These tests give a reasonable assessment of a coupling's ability to resist both fatigue and torsional overload. Are also presented the tests results with their interpretation and the conclusions about coupling behavior in specific operating conditions (high speed and large misalignments).

**THE STUDY OF INFLUENCE
OF COAXIALITY DEVIATIONS
OF SHAFTS OVER FLEXIBLE MEMBRANES
FROM ELASTIC COUPLING
WITH METALLIC ELEMENTS
(MEMBRANE TYPE)**

Daniel Dobre, Andrei Dobre
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The paper analyses the membrane stresses which are influenced by the torque transmission, speed of rotation, misalignment deflections and the method of attachment to the adjacent components. In high speed applications the centrifugal loading has a significant stiffening effect, increasing the resistance to torsion and misalignment deflections.

To assess the membrane stresses it is necessary a study of the membrane assembly, based on finite element analysis, study that will be the subject of other paper.

**THE INFLUENCE OF DEVIATIONS
OF CAM PROFILE OVER THE KINEMATIC
AND TRIBOLOGIC PARAMETERS
AT CAM – CAM LEVER COUPLING
WITH PLATE CUP**

Constantin Onescu
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The cam mechanisms precision is treated in different papers with accents on the cam.

The follower displacement is influenced by the factors like: the technological precision of contact elements; dimensional variation due to thermal deformation; elastic deformation for the cam and follower; clearances from the kinematics joints cam-follower-guide follower.

In this paper it shows that the small variations of cam profile – undulations or smallest wears – adhesive type, in generally create high variations of the follower accelerations, in this way the inertia force surpass the initial values considered in design of this mechanisms.

The contact cam and follower surfaces deforms elastically, sometimes even plastically, generating rectangular contact areas in which exist always rolling and sliding motion. In this context, the present paper studies the influence of the cam profile deviations on the follower movement laws, respectively cam-follower contact and on the tribologic parameters from contact like friction velocity, hydrodynamic velocity, sliding coefficients which don't have the variation laws from cam without cam deviations, with bad influence on the coupler lubrication.

**SECONDARY INTERFERENCE
PHENOMENON
IN THE INNER TECHNOLOGICAL GEAR**

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This paper shapes the secondary interference phenomenon in the interior technological gear with the pinion shaped cutter. We deduce the interference avoidance conditions and we also identify the depending factors. Based on the observations of the influencing factors, we can appreciate the possible steps for the interference phenomenon avoidance.

**STUDIES CONCERNING
THE OSCILLATION MECHANISMS
AT DETACHMENT SYSTEMS
USED FOR HARVESTER_THRESHERS**

Eugenia Călin
University POLITEHNICA Bucharest, ROMANIA

The paper presents the cinematic scheme of the mechanisms used for running of the harvester-threshers.

**PRACTICAL ASPECTS CONCERNING OILS
PROPERTIES**

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This paper covers an important property of lubrication oil – viscosity. It is analysed the temperature effect over the viscosity, the effect of the pressure over the viscosity and also, the viscosity of oils mixtures. The paper represents a practical guide for choosing it and it in different kinds of applications.

**CONTRIBUTIONS CONCERNING
THE FRETTING FATIGUE**

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Fretting damage is often the origin catastrophic failures or loss of functionality in many industrial applications. Considered as a plaque for modern industry, fretting is encountered in all quasi-static loadings submitted to vibration and thus concerns many industrial branches. In this domain there are three basic notions: fretting wear, fatigue fretting and corrosion fretting.

FRETTING FATIGUE -PLASTICITY CRITERIA

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Considered as a plague for modern industry, fretting is encountered in all quasi-static loadings submitted to vibration and thus concerns many industrial branches. This papers studies crack nucleation using fatigue criteria in the case of an elastically loaded dry contact.

LUBRICATING PROCESSES IN SLIP CONDITIONS- A NEW APPROACH OF NAVIER STOKES ECQUATIONS

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The study of the lubricating processes in slip conditions represents a first step in a new research area, which analise the interactions at nanaometric level between material and lubricant. Beginning with the realisation of some complex materials and a new class of fluids, it has been approuved that the Navier-Stokes equations, cannot correctly describe these lubrication processes. For such of cases, the researchers have observed that in the contact area the no-slip condition is not accomplished anymore. In these circumstances, the classical limit condition of the hydrodynamic theory must be modified, by takeing account of a slip in the contact area of the fixed wall, which is proportional with the velocity gradient.