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CREEP AND OTHER IRREVERSIBLE DEFORMATION IN ULTRA HIGH PRESSURE APPARATUS

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Ultra high pressure apparatus used in industrial purposes are manufactured in compound construction. The nearest components for synthesis capsule (a die and two anvils) are made from tungsten carbide. These WC-Co components are binding with steel rings. The pressure in the synthesis capsule from the die is above 4.5 GPa and temperature above 1700K. In this paper are analyzed the stresses in the die and the behavior of the material of the die in these conditions. The plastic deformation of the die made from tungsten carbide resulted in the creep fatigue process presented. The correlations between the plastic deformations and the process parameters are shown.

MACHINERY FOR THE REHABILITATION AND CONSOLIDATION OF ROAD SYSTEMS

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This paper presents some machinery for the modern technologies of the road rehabilitation and consolidation. These special machineries are included into the large family of the machinery for construction, maintenance and rehabilitation and consolidation of the roads. In the actual stage of the roads network, when the most of the roads are already built, but these roads have many year of utilization and also they haven't the capacity to support the requirements of the actual traffic, the main purpose, in comparison with the construction of a new roads or maintenance of the actual roads, is rehabilitation and consolidation of the actual roads.

MODERN METHODS OF REHABILITATION AND CONSOLIDATION OF ROAD SYSTEMS

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This paper presents modern technologies for road rehabilitation, consolidation and reconstruction of the base layer. These technologies are selection according with the type of defects of the road layer, and each of these is present with the special machines which are utilization. These technologies are utilized with hot or cold milling or scarification of the wearing layer and with or without mixture between the old material and the material addition.

RESEARCH REGARDING THE RUNNING MODE OF THE VALVES OF THE EXTRACTION PUMPS

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The paper work presents the experimental researches regarding the running mode of the valves of the extraction pumps. It spotlights the fact that the valves closing and opening moments are preceded by a phase difference bigger during the opening and smaller during the closing and due to the percussion phenomenon during the closing period between the ball and the seat-ring take place one, two or three elastic collisions having lower raising high. Corresponding to these processes there occur liquid leaking that influence the volumetrically efficiency of the extraction pumps.

STRUCTURAL AND MICROSCOPICAL ANALYSIS OF THERMOMECANICAL WORKED MEMBRANES OF MOTOR CLUTCHES

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The technology of manufacture of the spring-disk diaphragms for automobile's clutch pedals by controlled thermo-mechanical treatments on automatic technological lines of bended quenching has as purpose to obtain the proper quality of the finished products in conditions of economic efficiency and observing the requirements of the European environment directives. The quality of the diaphragms is determined by the structure obtained after the thermo-mechanical processing. The main technological parameters which influence the quality of the diaphragms of the automobile's clutch pedals are: quenching temperature, maintaining time at quenching, tempering temperature, maintaining time at tempering, cooling speed, degree of

deformation by bending. The structure of tempering troostite is a structure corresponding to the automobile's clutch pedals, offering them the tenacity and elasticity requested by the exploitation conditions.

STRUCTURAL ANALYSIS OF BIMETALLIC FILMS OF MOTOR COMPONENTS

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The light component parts of the automobiles (bearings, supports, axles, bushes) of bi-metallic half-products obtained from the liquid phase are achieved by the application of the horizontal spin casting procedure. The technology can be applied on an automatic line, succeeding the strict survey during the process of the main technological parameters and of the finished product. The main objective is the increase of the reliability and of the performances of the light component parts of the automobiles by an optimization of the structure and properties. The quality of the bimetallic component parts of the automobiles is determined by the structure of the joint that is strongly influenced by the temperature and the joining time.

METALLOGRAPHYCAL RESEARCH OF BOROCARBOVANADIUM BLANKS

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The boron-carbon-vanadium treatment has as purpose the enrichment of the superficial layers of the tools of plastic deformation and machines parts with the following elements: carbon, boron, vanadium. By the boron-carbon-vanadium treatment, beside the structural modifications, also modifications of the chemical composition take place in the superficial treated structures. Between the base material of the parts and the superficial layer treated with boron-carbon-vanadium a net difference of structure and mechanical characteristics is created. The difference between the superficial layer and the core can be accentuated by the application of certain treatments by respect to which the two zones have a different behavior. The structure influences the characteristics of the superficial layers treated with boron-carbon-vanadium.

MICROHARDENESS DETERMINATIONS ANALYSIS FOR SUPERFICIAL FILMS WITH BOROCARBOVANADIUM

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The boron-carbon-vanadium treatment supposes the introduction of the tools and machines parts, covered with hardening paste, in the work precincts of the furnace in which the carburizing mixture exits. This carburizing mixture serves as source of active atoms. The heating of this assembly is achieved up to the optimum temperature 900-950°C and the maintaining during a time determined by the depth of penetration of the atoms. The boron-carbon-vanadium treatment supposes the following steps: Step I: dissociation – decomposition of the molecules in active atoms of C, B and V; Step II: absorption – the phenomenon of acceleration at the parts surface of the active atoms of C, B, V and the interaction of these ones with the atoms of the base metal 21MoMnCr12; Step III: diffusion – migration of the atoms absorbed by the surface of the treated part towards the interior. The layers treated with boron-carbon-vanadium present a high micro-hardness, suitable from the quality point of view.

COMPLETE CHEMICAL SOLUTIONS WITH CHRYSAN INDUSTRIES

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Chrysan Industries, Inc. is a manufacturer of metalworking fluids and lubricants, which is committed to provide customers with the highest quality, innovative products and highest levels of technical, prompt and professional support.

THE MATHEMATICAL MODELLING AND RESIDUAL TENSION ANALYSIS IN THE COATINGS OBTAINED BY THERMAL SPRAYING USING THE FINITE ELEMENT METHOD

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The topic that the project aims to achieve is an original approach regarding the remnant tensions in the coatings obtained by thermal spraying, at the

level of the sprayed particle, using the finite element method and the facilities of the program package ALGOR for mathematical modeling.

INOVATIVE AND ECOLOGICAL WELDING/PROCESSING TECHNOLOGIES FOR ALUMINUM AND ITS ALLOYS

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In paper are presented aspects about trends and actual stage on world level for utilization of aluminum alloys, as well as consideration about environmental impact, consequence of significant increase utilization of these alloys .It is presented the innovative and ecological friction stir welding (FSW) procedure, technological alternative for arc welding of aluminum alloys, realization and contribution for aluminum alloys welding. To complex characterization of the quality of the welded joints, was developed a program that included destructive tests on welded joints, tensile and bending tests, but also non destructive tests, macro and micro-metallographic analysis, X ray control and penetrate liquids control. In the end of the paper is realised a comparison between friction stir welding and classical welding procedure, concerning consideration about economical and environmental impact in production process, work pieces preparation, equipment maintenance and furnishing.

MECHANICAL PROPERTIES OF SINTERED AlN

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Effects of temperature and porosity on mechanical properties and a mechanism of failure in sintered AlN have been studied. Samples of various densities were produced by pressureless sintering of the AlN nano-powder.The strength of sintered AlN with porosity of 2% is about 300 MPa at room temperature. At temperatures higher than 800 ^{o}C the strength of AlN drops sharply. The higher dislocation density indicates the development of the plastic deformation in the regions near AlN grain boundaries during crack propagation.

BIODIESEL − REGENERABLE FUEL USED IN TRANSPORTATIONS

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The short theme presentation is followed by the exposure of regenerable fuels used in transportations and their functions, structured on bioethanol − for gas replacing and on biodiesel − for diesel oil replacing, as well as the importance in using them as additives.
The vegetable origin materials are analyzed on two groups: alimentary and non alimentary, giving examples of energy-vegetable crops. The biodiesel itself is forwards presented, with examples of quantities produced in Romania and in other countries, mainly from rape and soybean crops.
Some considerations regarding the energy content and diesel oil-biodiesel energy balance, as well as the ecological character of biodiesel production and use are made, in a view to defending the vegetable alimentary crops, focusing some essential conclusions.

INNOVATIVE TRIBOMETERS AND SCRATCH TESTERS

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TRIBOtechnic equipment is the culmination of 18 years of market experience and 30 years of tribological testing. TRIOBOtehnic' instruments have exclusively patented features for Research and Development or measuring Quality Control.
They are conform to industry standards, they are user friendly and economical to maintain.
Among TRIBOtechnic instruments very important are scratch test instruments for adherence characterization and scratch resistance for thin coatings and bulk materials and tribometer for coefficient of friction measurement.

TRIBOLOGICAL SOLUTION TO REDUCE THE WEAR RATE IN THE DIE AND THE CYLINDER FOR CERAMIC MVFF

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A simple physically – based model for the adhesive wear of steel material is presented on the mechanics

and mechanisms associated with Bingham flow ceramic mixture. The model is based on the assumption that any contact point between cylinder and ceramic mixture is sliding. This model is used to decrease the wear of mechanical system (cylinder and metallic die) to manufacture a ceramic muff. The solution technique to increase the durability of cylinder and die for ceramic muffs can also be used to solve arbitrary study cases.

CONSIDERATIONS ABOUT THE FLOW OF THE NON-NEWTONIAN FLUIDS IN THE REGIONS WITH DISCONTINUITIES, PARTICULARIZED TO PIPES NETWORKS

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The flow process of the Non – Newtonian fluids will be studied based on the Navier- Stokes equations and solved by the finit element methods. The rheological model characteristic for the fluids is the viscoplastic Bingham model. For the pipes networks, the interesting regions are those with discontinuities, such as: reduction of section, pipe ramification. For these cases, the velocity distribution, the pressure gradient and the shape of the stagnant core will be determined.

INNOVATION AUDITS CONCEPT, EXPERIENCES AND OPTIONS FOR TTI CENTERS IN ROMANIA

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Innovation Audits (rather than Technology Audits) present as main interest points: Background, the IRC Innovation Audit Concept, Example from the German / Dutch / Belgian Border, Lessons and finally - Options for Romanian TTI entities.
The innovation performance of Romanian firms still is weak. Considering as an Innovation Gap is the Risk to become an inhibitor for transformation and growth.
The same situation was and is known in many other EU MS (also in Germany).One (amongst many other) concepts to increase the innovation performance is the innovation audit.

RESEARCHES CONSIDERING NEW TRENDS IN PRODUCT LIFECYCLE MANAGEMENT

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Product life cycle (PLC) is referring to the life of a product in the market, considering business and commercial costs and sales measures.
Product Lifecycle Management analyses managing descriptions and properties of a product, through its development and useful life, mainly from a business/engineering point of view. There are presented the five stages products lifecycle and their characteristics, important concept of Product Lifecycle Management and new trends in PLM, emphasizing PLM good practice examples in this domain. Conclusions point some of concrete benefits of PLM software application.

MANAGEMENT OF INNOVATION THROUGH SOCIAL SOFTWARE AND COLLABORATIVE LEARNING

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The "MISS –Management of Innovation through Social Software and Collaborative Learning" project was initiated by ITA (Aragon Institute of Technology-Spain) and is financed within Lifelong Learning Programme – Leonardo da Vinci.The general aim of the project is to develop the contents of an Innovation Management course through NTIC and the didactic resources that provides the collaborative learning.

POSITIVE SYNERGY GENERATION IN INDUSTRIAL ENTERPRISES BY USING THE HARMONIZATION OF BINOMIAL EXPRESSION ORGANIZATIONAL CULTURE - FIRM STRATEGY

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Firm's competitiveness depends on strategy quality and on its support – the organization culture. Both are in harmony and they represent the major source of positive synergies which leads the firm from failure to success, competitiveness and even excellency. The paper proposes the idea to change the corporate feeling of managers and staff, by presenting the evolution trend to border the firms, by perseverance and good faith.