

STRESZCZENIE

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UTILIZATION OF VEHICLE CONTROL-DIAGNOSTIC SYSTEM IN EVALUATION OF ENERGETIC PARAMETERS

In modern tractors and farm machinery newest electronic and information technologies, controlling not only engine work parameters but also operation of other sub-assemblies of the vehicle, are used. It enables real time exchange of information between controllers of tractor engine or whole agricultural unit. Evaluation of technical condition is possible on level of real time monitoring of diagnostic parameters, as well as by means of portable diagnostic systems. Utilization of on-board control-diagnostic systems, with installed automatic tests algorithms controlling operation of particular sub-assemblies, is also possible. Goal of this paper was evaluation of energetic parameters of John Deere 6920 tractor by means of on-board diagnostic system utilization. Tractor engine energetic parameters obtained as a result of such investigations enable evaluation of energetic "saturation" of a tractor. Establishing characteristics of changes course for: torque, power and unitary fuel consumption enables determination of rotation speed range for optimal operation of an engine. Using on board diagnostics of agricultural tractor as well as additional external diagnostic system Service ADVISOR eases location of damages and failure repair in tractors and farming machinery. It also enables determination of unitary fuel consumption ge, precisely enough to be used in establishing its value for practical purposes.

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Zhytomyr State Technological University, Ukraine

UNIT OF ADAPTATION GRIPPERS OF INDUSTRIAL ROBOTS

In the paper presents a new approach to decision the problem of adaptation grippers of industrial robots to changing negative force-torque loads at the time of technical robotized kit fixing in the device of position working. Capabilities and basic elements of unit of adaptation grippers for industrial robots presented.

Janusz LUBAS
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A COMPARISON OF THE TRIBOLOGICAL BEHAVIOURS MATERIALS MODIFIED OF BORON IN THE SLIDING PAIRS

The aim of the present work is to determine the influence of technologically produced boron surface layers on the friction parameters in the sliding pairs under lubricated friction conditions. The tribological evaluation included ion nitriding, powder-pack boronizing, laser boronizing, hardening and tempering surface layers and TiB₂ coating deposited on 38CrAlMo5-10, 46Cr2 and 30MnB4 steels. Modified surface layers of annular samples were matched under test conditions with counter-sample made from AlSn20 bearing alloy. Tested sliding pairs were lubricated with 15W/40 Lotos mineral engine oil. The tribological tests were conducted on a T-05 block on ring tester. The applied steel surface layer modification with boron allowed creating surface layers with pre-determined tribological characteristics required for the elements of sliding pairs operating under lubricated friction conditions. Boronizing reduces the friction coefficient during the start-up of the frictional pair and the maximum start-up resistance level is similar to the levels of pairs with ion nitride surface layers.

Peter MALEGA

Technical University of Košice, Slovakia

MODEL THAT RATES TECHNICAL EFFECTIVENESS OF PRODUCTION

This paper is about the model that rates technical effectiveness of production. This paper is applied on selected company, which has problems with technical criteria that are important for technical effectiveness of production. The last section of this paper presents proposed model that rates the technical effectiveness of production, which could be used (maybe with modification) in the production companies.

Peter MALEGA

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Jozef MALEJČÍK, Janette BREZINOVÁ, Anna GUZANOVÁ

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HIGH SOLID COATINGS QUALITY IN SELECTED CORROSION MEDIA

The ecological approach to surface treatments with organic coatings requires a reduction in the proportion of coatings containing volatile organic solvents, VOCs - Volatile organic compounds. One of possible solutions is to substitute solvent paints by water diluted and high-proof materials. The contribution presents the results of research aimed at establishing high solid coatings quality by accelerated laboratory tests in conditions of artificial atmosphere.

Alexander MALYARENKO, Maxim MITENKOV, Sergey KVASUK

Byelorussian State Polytechnic Academy, Minsk, Byeloruss

RESEARCH OF LAP THERMAL DEFORMATION AT OPERATIONAL DEVELOPMENT OF OPTICAL SURFACES AT THE EXPENSE OF A TEMPERATURE VARIATION OF POLISHING SLURRY

The outcomes of experimental research of temperature influencing of polishing slurry on machining accuracy of optical surfaces are resulted at different rotational speeds of the lower link at operational development by laps with a different profile of cross section. The guidelines on perfection and implementation of optical surfaces operational development at the expense of a temperature variation of polishing slurry are given.

Mariana OLEXOVÁ, Ján SLOTA, Attila HERDITZKY

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MICROSTRUCTURE EVALUATION OF TRIP STEEL USED IN A CAR CRASH ZONES

The paper deals with evaluation of TRIP (transformation induced plasticity) steel microstructure. These special steels are commonly used mainly in automotive industry for crash zones of car's bodies. The TRIP steel has high strength compared to AHSS steel, but on the other hand a good plastic properties. The microstructure properties of TRIP steel were investigated by a light microscope and evaluated by a computer program ImageJ. Microstructure characteristics of TRIP steel was investigated on shape-complicated part made by deep drawing process.

Jaroslav PASTERNAK, Heorhiy SULYM*

Lutsk National Technical University, Ukraine; *Białystok Technical University, Poland

THE UNIFIED APPROACH FOR THE ANALYSIS OF ELASTIC EQUILIBRIUM OF SOLIDS CONTAINING THIN INTERNAL AND SURFACE HETEROGENEITIES

This paper develops the unified approach for the analysis of plane elastostatic problems for solids containing thin elastic inclusions or overlays. The approach is based on the previously developed integral equation method for the solution of plane elastostatic problems for solids with perfectly embedded inclusions. In this paper the method is extended to the case of delaminated inclusion and elastic enforcing overlay. Thus, the wide class of problems can be solved basing on the developed technique.

Victor SHABAYCOVITCH

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COMPETITIVENESS OF MANUFACTURE

In crisis, the competitiveness edge of a claimed produce acquired a special value. The paper considers the structure of competitiveness as a unity of quality, expenditure, profit and prices; describes method of forming competitiveness. It exemplifies an erroneous interpretation of competitiveness and methods of its "rapid determination". To analysis and synthesize an integral level of competitiveness, one may use the SADT method of detailed step-be-step hierarchy of the objects under study.

Ján SLOTA, Ivan GAJDOŠ

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NUMERICAL SIMULATION OF THE HYDRAULIC BULGE TEST OF HSLA STEEL AND EXPERIMENTAL VERIFICATION OF RESULTS

In sheet metal forming operations the mechanical properties of the sheet metal (stress-strain curve, flow stress) greatly influence metal flow and product quality. Accurate determination of the stress-strain relationship is important in process simulation by finite element method. In this paper the sheet thickness gradation in different points of the hemisphere formed in the bulge test is analyzed, both by simulation and experimentally. A precise determination of sheet thickness at the pole is very important in the precise determination of stress-strain relationship. The aim of this paper is to show on some aspects of numerical simulation of hydraulic bulge test and experimental verification of obtained results.

Lýdia SOBOTOVÁ, Emil SPIŠÁK

Technical University in Košice, Slovakia

THERMAL DRILLING AS A PROGRESSIVE TECHNOLOGY OF CREATING OF BUSHINGS

The contribution deals with joining of materials and creating of bushings from aluminium materials, with using of new joining technology by thermal drilling, it means by Flowdrill method. This method is using at joining of materials such as sheets, pipes, hollow profile, where the thickness of material does not allow to make the drilling with enough number of threads. Also we can compare this thermal drilling technology with production of smooth cylindrical and conical bushings by forming technologies as hole burnishing. This paper was made with cooperation with firm Commerc Service spol.s.r.o., Prešov.

Lýdia SOBOTOVÁ
Ludmila DULEBOVÁ

Technical University in Košice, Slovakia

EVALUATION OF SOME MECHANICAL PROPERTIES OF STEEL SHEET

The requirement for reducing of weight of products urges the producers to reducing thickness of used materials. It means the reducing of thickness of products from sheet. The second requirement for product is its adequate stiffness. These requirements force product manufacturers from sheet material to ask for development of sheets with higher strength properties and formability from sheet producers. The properties of sheet must guarantee deep- drawing of stampings without problems, but with required qualitative and dimensional parameters. The contribution solves the problem of deep drawing of bath tubes and pressability of steel sheets used at the production of bath tubes. The thickness of used steel sheets were changed from 1,55 mm to presented 1,35 mm. This change had an influence on the required properties of steel sheets and also the changes of technological conditions of deep drawing. The next surface finishing of pressing - bath tube requires the roughness of surface in the defined boundary.

Emil SPIŠÁK, Jana MAJERNÍKOVÁ
Technical University in Košice, Slovakia

ANNEALING PROCESS AND ITS INFLUENCE ON MECHANICAL PROPERTIES OF PACKAGING SHEETS

In the contribution sheets made by single rolling and double reduction, batch and continual annealed have been compared. The comparison has been done based on two tests, by uniaxial tensile test and earring test.

Emília SPIŠÁKOVÁ
Technical University of Košice, Slovak Republic

THE COMPARISON OF INNOVATION ACTIVITY OF SLOVAK AND POLISH ENTERPRISES

The article deals with the evaluation and comparison of innovation activities of Slovak and Polish enterprises. It is focused on the number of innovative enterprises according to their size (small, medium, large enterprises) and according to the sector of their operation (industry, services, construction). The attention is also paid to the cooperation of enterprise in the innovation's creation and development, i.e. to the cooperation from the perspective of countries of partner operation, from the perspective of the type of cooperating subject or institutions and from the perspective of those who participated in the creation of new or significantly improved product or process (either the enterprises itself or enterprise in cooperation with other enterprises, respectively new products or processes are developed by other enterprises).

Marko TODOROV, Ivo DRAGANOV
Ruse University "Angel Kanchev", Bulgaria

EQUATIONS OF ELASTICITY THEORY IN A HELICAL COORDINATE SYSTEM

The present research provides working out the equations of solid elastic continuum in non-orthogonal helical coordinate system. A comparison has been drawn with regard to known equations of static, geometry and physics in a cylindrical coordinate system. Some examples have been provided solution to.

Ján VARGA, František GREŠKOVIČ
Technical University in Košice, Slovakia

THE INFLUENCE OF RADIATION CROSSLINKING ON MECHANICAL PROPERTIES OF PLASTICS

The presented article deals by the application area of radiation cross-linking of plastics, which follows after the processing (injection moulding, extrusion or blow moulding). The main objective of the presented article is investigation of influence irradiation dosage on mechanical properties of materials: PP filled by 15 % of mineral filler – talc. Mechanical properties - tensile strength were examined in dependence on absorbed dose of the beta rays on various conditions and were compared with non-irradiated samples

Ján VIŇÁŠ, Janette BREZINOVÁ, Anna GUZANOVÁ
Technical University of Košice, Slovakia

TRIBOLOGICAL PROPERTIES OF SELECTED CERAMIC COATINGS

The contribution deals with methods of plasma sprayed ceramic materials evaluation. There were evaluated ceramic coatings A 99, Cr₂O₃ and Cr₂O₃ + 5% TiO₂. Influence of the interlayer NiCr on the functional properties of sprayed coatings was also studied. There were determined thickness, microhardness and adhesion of particular coatings together with their resistance to abrasive wear and thermal cyclic loading.

Ján VIŇÁŠ, Janette BREZINOVÁ, Anna GUZANOVÁ, Denisa LORINCOVÁ
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HARD SURFACING REPAIRING LAYERS IN EROSIVE WEAR PROCESS

The contribution deals with evaluation of tribological properties of two types three-layer hard surfacing claddings with various structural bases. There were used samples made out from S235JRG2 EN10025-94 as reference material. Within the frame of experimental works there was realised metallographic analysis, measuring of hardness and microhardness of claddings before and after erosive wear loading. Erosive wear was evaluated by simulation of erosive action. Aim of research was to determine influence of erosive particle impact angle and structural composition of claddings on their wear resistance.

Ján VIŇÁŠ, Ľuboš KAŠČÁK, Milan ÁBEL, Dagmar DRAGANOVSKÁ
Technical University of Košice, Slovakia

THE QUALITY ANALYZE OF MIG SOLDERING ZINC-COATED STEEL SHEETS BY DESTRUCTIVE TESTING

In the paper results of metallographic analyses of joints made by MIG brazing on high strength galvanized steel sheets of H 340LAD + Z EN 10292 are presented. The quality of brazed joints made by SG CuAl8 braze with fluctuating welding rectifier CLOOS 303 MC4 was evaluated. Argon 4,80 was used as gaseous shield. Soldering joints quality was evaluated by destructive testing. The bearing capacity joints were evaluated by STN EN ISO 895 and STN EN 1321. Macrostructure and microstructure analyze of joints were realized too.

Franciszek WOLAŃCZYK
Rzeszów University of Technology, Poland

THE INVESTIGATION OF THERMAL CONDUCTIVITY OF LOW-ALLOYED HIGH SPEED STEELS

In the presented work the effective thermal conductivity of three alloyed high speed steels: SW3S2, SW7M and SW2M5 were compared. The thermal conductivity was received from the simple experiment in which the change of phase metrology-matter was applied. As the metrology-matter gallium was used. The value of the thermal conductivity for high speed steels was compared with date of science literature.

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COMPARISON OF RAPESEED ETHYL AND METHYL ESTERS UTILIZATION INFLUENCE ON ENGINE ENERGETIC PARAMETERS

Use of plant oil methyl esters as a fuel for diesel engines is popular practice however it is also possible to utilize ethyl esters. In this paper, results of research concerning utilization of methyl esters (FAME) and ethyl esters (FAEE) of rape oil for powering diesel engine were presented. Results enabled comparative analysis of effects of powering diesel engines with these fuels. Research was based on taking, for each of the investigated fuels, measurements which enabled elaboration of data necessary for drawing external characteristics, on basis of which effect of esters utilization on energetic parameters was evaluated. Research was carried out on, installed on dynamometric stand, 2CA90 engine. Results of the research did not prove determining influence of utilized ester type on engine energetic parameters.

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THE CARBON LAYERS FOR BIO-TRIBOLOGICAL APPLICATIONS

One of alternatives for improving the wear resistance and corrosion of biomaterials is the application of protective coatings. DLC coatings are one of the most attractive proposal of the last years for biomedical applications. The aim of this contribution is to compare the mechanical properties for CoCr materials surfaces deposited with DLC coatings under different deposition parameters. DLC coatings were deposited by PVD method (physical vapor deposition) on CrCo alloy-substrate used for bioimplants.