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УДК 621.791
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HIGH TECHNOLOGIES IN MACHINE-BUILDING

Determinations for complex, combine, integrated and synergetic technologies are represented in this article. Spheres of best using for complex, combine, integrated and synergetic technologies are looked.
Keywords: *high tech, complex, combined, integrated, synergistic technologies, product quality, competitiveness of the products.*

УДК 621.65.011:621:73.07
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RESTORATION TYPE SELECTION COLUMN GUIDES FOR RE-ADJUSTABLE STAMPS

The possibility of restoration and strengthening of column guides detonation-gas spraying. Found an increase in wear resistance of the coated surface PG 10N-01 1.5 t. compared with the columns made of a carburizing steel 20.
Keywords: *detonation spraying, reinforcing coating adhesive strength, porosity, durability.*

УДК 621.65.011:621:73.07
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A COUNT OF INERTIAL FORCE IN DESIGN OF HOLDING ORGANS OF SHIFTED RELOADERS FOR AUTOMATIC IMPRESSION DIE-FORGING BY PRESSES

Analyse of condition of position moving of cylindrical billet by holding organs of shifted reloader are execute. Levels of influence of velocity reloading and weight of billets on necessary force of pressing of holding organs were determinate for technologies of automatic impression die-forging by crank-shaft presses.
Keywords: *shifted reloader, billet, holding organ, force of inertia, volumetric die-forging by presses.*

УДК 621.7.793:621.65.073
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THE MAIN TRENDS TO IMPROVE RELIABILITY OF THE MACHINE

The article deals the ways and methods to effectively improve the performance properties of engineering products by improving the quality of the surface layers of parts, as well as used in the processing of the various methods of the corresponding equipment and instrument.
Keywords: *surface coating, surface strengthening, machining tool, coating methods, coating, wearability.*

УДК 621.791.039
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UNIVERSAL PREFABRICATED RECONFIGURABLE DEVICES FOR MANUFACTURING PIPELINES COMPLEX CONFIGURATION

The article contains results of studies on the development and implementation of universal reconfigurable devices for assembly welding pipelines complex configuration for various branches of engineering and integrated automated preparation of production.
Keywords: *machine-tool attachment, universal assembly and disassembly devices, generative planning system, welding, assembly, modularity.*

УДК 621.98.044
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METHODS TO IMPROVE THE EFFICIENCY OF STAMPING TECHNOLOGY ESPECIALLY SUBTLE DETAILS OF THE NON-METALLIC MATERIALS DURING DIVIDING OPERATIONS

It was proposed the technology of obtaining details of particularly thin materials (up to 0.15 mm) of non-metallic materials (carbon plastic, fiberglass, foil material) by pneumatic percussive punching-cutting with using a combination of media (liquid, polyurethane, liquid – polyurethane – lavsan). The proposed schemes allow increasing the quality of parts and durability of die tooling.
Keywords: *die forming, punching, light-gage nonmetallic materials, pneumaticmechanical forming, machine-tool attachment.*

УДК 621.7.044
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STRUCTURAL ANALYSIS TOOL FOR EXTRACT CYLINDRICAL PARTS IN ORDER TO IMPROVE THEIR DESIGN FOR INTENSIFICATION OF THE PROCESS

The review of design tool to extract parts from sheet material, showing its design advantages and disadvantages, showing the effect of various design parameters of the die and punch on the stress-strain state of the draw.
Keywords: *punch, die, billet, extract.*

УДК 621.7.044
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PREDICTION FOLDING THE DRAW BOX-SHAPED LOW BLANKS

Theoretical studies aimed at the study of drawing box-like parts in a single transition, and identified the main design and process parameters that affect the folding of the flange portion of the blank defined zone of possible occurrence of wrinkles at an early stage of deformation.
Keywords: *extraction, blank, strain, stress, displacement.*

УДК 629.11.012.3
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IMPROVEMENT OF METHODS FOR DETERMINING THE TWISTING MOMENT PROFILING WHEEL RIM

Theoretical studies on the improvement of methods for determining the twisting moment machines in the manufacture of wheel rims by radial rotary profiling, based on the definition of the lower boundary of the efforts of profiling.
Keywords: *rim, force, twisting moment, profiling.*

УДК 622.276.05.004
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IMPROVING LIFE DURATION OF THE MULTISTAGE CENTRIFUGAL BOREHOLE PUMPS BY TECHNOLOGICAL METHODS OF SURFACE TREATMENT

It examines the impact of technological factors of surface treatment of end friction pairs in electric submersible pumps for the extraction of reservoir fluids and their parameters are optimized.
Keywords: *electric centrifugal pumps, motor seal section, source, seal.*

УДК 621.793.7
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FEATURES OF THE FORMATION AND STRUCTURE SPRAYED COATING AFTER MACHINING

The results of experimental studies of the influence of machining efficiency of the brush tool on the properties of reconstruction of gas-flame coatings. It is shown that the use of flamespraying technology integrated with brush processing provides the possibility of increasing the quality of coatings deposited by conventional techniques.
Keywords: *integrated technology, gas-flame coating, machining, tool brush, porosity, microstructure, microhardness.*

УДК 621.822
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INFLUENCE OF CUTTING MODES UPON PROCESSING QUALITY FOR SCREW SECTIONS OF FLEXIBLE CONVEYERS

There were established the rules for shift of constituent cutting power P_y bristling of processed surface due to the frequency of subject rotating, shipment and depth of cutting during the sections WB FSC processing St 3 and steel 08.
Keywords: *flexible screw conveyer, working body, drilling, section, technology.*

УДК 621.73
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SIMULATION OF THE FORM CHANGING OF RELATIVITY HIGH WORKPIECES DURING UPSETTING BY CONVEX PLATES WITH ECCENTRICITY OF THE LOAD

Finite element simulation of profiling of upsetting of relativity high billets by convex plates with eccentricity of the load was executed. Graphics of depending of form-changing indexes of profiled work-piece from degree of upsetting with fixed eccentricity of the load and different relations of radius of convexity plates to diameter of the work-piece were obtained.
Keywords: *high billet, profiling, upsetting, convex plates, eccentricity, form-changing.*

УДК 621.979
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EXPERIMENTAL STUDIES OF THE FORMATION OF THE HARDWEARING SURFACE LAYER OF WORK ITEMS SEPARATION STAMPS

The materials of the article present the results of experimental studies of the combined effect of different methods of surface hardening of work items stamps for separation operations. Identified the most optimal modes of processing based on their surface plastic deformation by the ball and the electrospark doping of different materials cutting edge equipment.
Keywords: *stamp, surface hardening, combined hardening, electrospark doping, surface plastic deformation.*

УДК 621.922.04
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CONTROL OF THE CUTTING PROCESS OF ULTRA-FINE-GRAINED LOW-CARBON STEEL

The results of the machinability of low-carbon steel with the volume ultra-fine-grained structure during machining in comparison with their counterparts coarse-grained are adduced.
Keywords: *ultra-fine-grained materials, low-carbon steel, machining.*

УДК 621. 855
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RESEARCH OF RESONANCE VIBRATIONS OF FLEXIBLE TUBULAR SCRAPER CONVEYERS OF TWO-DIMENSIONAL ELEMENTS

Investigate the dependence of frequency natural oscillations of rope for speed movement friable environment, its amplitude, physical and mechanical properties of the material in tubular drag conveyors and conditions for the existence of resonant oscillations and a periodic perturbation of the system. Displaying dependence of resonance oscillations, and maximum dynamic rope efforts from kinematic, geometric, mechanical parameters and the stability of the process.
Keywords: *rope, vibration, amplitude, speed.*

УДК 6251.7.044
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ACCOUNT EFFECT OF BAUSHINGER AT MODELING PROCESS OF COMPLEX DRAWING

The physical essence of transmitting anisotropy of deformable sheet billets connected with the effect of Baushinger is considered. The analysis of the theories of plasticity of isotropic material with anisotropic hardening is given. The dependences for determining bending moments are received taking into account transmitting hardening at bending on a rather large radius, a radius of a neutral layer, longitudinal force and radius of a neutral layer at bending with tensile ductility. The mathematical model of the drawing process of items with complex configuration which is taken into account transmit anisotropy is developed. The analysis of the results of calculation of lorry sheet billets.
Key words: *anisotropy, effect of Baushinger, complex extend, pressure.*

УДК 621.78
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MODEL OF HEATING OF COMPONENT PART UNDER THE EXPONENTIAL HEAT RELEASE CHANGE IN THE MATERIAL

On the basis of equalizations of the non-stationary thermal field of connection the model of heating of detail is offered at the exponential change of selection of heat in material.
Keywords: *sorting out, induction heating, heat conductivity, temperature, speed of heating.*

УДК 621.852.13: 621.73
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RELIABILITY OF TRANSMISSIONS BY STRAPS ARE A WEDGE OF MECHANICAL PRESSES

The questions of reliability of transmissions by straps are a wedge of mechanicall presses are considered. It is noticed that for transmissions by straps are a wedge the best presentation of function of reliability is described two by the self-reactance law of Veybull. The values of parameters of function of reliability for the transmissions of mechanical presses are certain on results the production tests of wedge straps of simples and maxipresses presses.
***Keywords**: press, transmission, straps are a wedge, reliability, longevity, refuse, law of Veybull.*

УДК 621.771
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ANALYSIS OF THE CURRENT STATE OF THE PRODUCTION AND USE OF SHAPED PIPES

The analysis found that the use of shaped pipes can significantly reduce the metal content of steel construction. In Ukraine, the assortment of shaped tubes are narrow and shaped tubes are made of relatively simple sections. Conducting scientific research will create a theoretical and technical basis for their production in Ukraine.
***Keywords:** shaped pipes, pipe making, assortment of shaped pipes.*

УДК 621.983
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THE DETERMINATION OF THE OPTIMAL ANGLE OF THE INLET CONE OF THE DOUBLE-CONE DIE FOR THE COMBINED DRAWING PROCESS OF THE AXIALLY SYMMETRIC PRODUCTS

The simulation of the combined drawing process in the cone and double-cone dies was performed by means of the finite element method. For the comparison of results of simulation and experimental data of the combined drawing process were used the power modes of the process. The impact of the angle of the inlet cone of the double-cone die on the drawing process force, the stress-strain state of the workpiece and the damage of the blank metal were researched. The optimal angle of the inlet cone of the double-cone die for the combined drawing process was defined for the production of the different thick wall and bottom part products.
***Key words**: the combined drawing process, the finite element method, the angle of the inlet cone of the double-cone die, the drawing process force, the stress-strain state of the workpiece.*

УДК 621.961; 621.983; 621.774
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COLD FORMING FROM SHEET PREFORM OF AN ARTICLE WITH TWO FLANGES BY USE OF PROCESSES OF A DRAWING, DISPENSATION AND DEPRESSION

The technique is developed for serial manufacture of an article from sheet preform with use of processes of a drawing, dispensation and depression. The finite element method fixes force conditions and an energy of deformation of blanking of a part. At calculations of the sizes of semifinished materials the saved up strains and stresses, a toughness resource deformed metal are considered. The sizes of a matrix which ensure a drawing in one operation instead of traditional processes are defined. Press forming processes can be realised on crank mechanism about 160 and 400 kH.
Keywords: *a cold sheet-metal forming, a finite element method, blanking, a drawing, dispensation, flange depression.*

УДК 621.74.04:669.112.22
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THE TECHNOLOGY OF SYNTHESIS CHROME-MANGANESE-NICKEL THERMITE STEELS MARKS «Х14Г14Н3Т»

In this papers was analyzed the results of research of the chrome-manganese-nickel thermite steels marks «Х14Г14Н3Т», where produced by metallothermic method using. The compo sition of reactions is used of exothermic charge and allows not only to get the chemical composition of alloy is offered, but also structure, physical, mechanical and official properties of steels. Thus taken advantage metallothermic synthesis, namely to get founding's in places, remote from the sources of electric power, industrial equipment. This material can be used for the urgent welding of purveyances casting.
Keywords: *thermite steel, metallothermy, structure, physical, mechanical and service properties.*

УДК 621.9.048
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INCREASE OF TREATMENT EFFICIENCY OF COMPLEX STRUCTURE DETAILS BY FLUIDIZED LAYER OF ABRASIVE

The results of research by performance treatment of complex structure details by fluidized layer of abrasive with additional pipelines introduction in machine are presented in the article.
Keywords: *treatment, abrasive, additional pipeline.*

УДК 621.923
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DIAMOND GRINDING POLYCRYSTALLINE SUPERHARD MATERIALS

Presents the results of theoretical and experimental works devoted to the development and research of progressive combined sanding process, to ensure the stability of the processing of composite materials, including polycrystalline superhard materials based on diamond and dense modifications boron nitride.
Keywords: *the processed material combined the process of grinding, diamond circle, the working surface of the circle, Autonomous zone, metal bunch round, the ruling cathode, ultrasonic vibrations, spark plug gap.*

УДК 693.6.002.5
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THE RESEARCH OF PIN GEAR EPICYCLOIDAL TYPE FOR LABOUR BODY PRESCRIBED MOTION

The authors pay attention to research and calculation of pin gear in machine, different from existing anagoges is conducted by existence of pin gear. The gearing contact line, geometrical place of points, the equation of a profile of teethes of an asterisk, angle of rotation of a lantern wheel from beginning to end gearings, and also overlapping coefficient are defined mathematically. Using the end results of research, production of an epicycloidal profile of an asterisk
is carried out.
Keywords: *pin gear, asterisk, epicycloid, overlapping coefficient, equidistant curve.*

УДК 681.5.015
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AUTOMATIZATION PROCESS OF STUDY GEOMETRIC DESIGN TOOLS

In the article describes the experience of implementing automated training disciplines, saturated engineering graphics, which allow significantly improve perception and learning, and release a teacher in practical lessons of permanent explanations by tutorial and provide a pleasant individual self-study. Also proposed a toolkit for creating and automatically verify the construction of graphic tasks in the system KOMPAS-3D.
Keywords: *education, computer-aided instruction, engineering graphic, software, computer-aided design.*

УДК 621.7.044
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RESEARCH OF A CURRENT OF THE MATERIAL IN BENDING SHEET METAL PARTS WITH LOCALIZED AREAS OF STRAIN

The article contains results of flow study materials in bending sheet metal parts with localized deformation region. Obtained the analytical dependencies of the deformation character, that allowed controlling the technological process. It was established the influence factors of the main parameters on the process of shaping the spatial conical workpieces by means of bending.
Keywords: *bending, diffuser, the local deformation, cone-shaped punch.*

УДК 625.7.08.002.5:616-07
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SUBSTANTIATION OF ENERGY-SAVING TEMPERATURE REGIME OF HYDRAULIC CONSTRUCTION MACHINES

The research proved that rational (by the criterion of useful maximum power) value of temperature (viscosity) of the working liquid depends on technical condition of the pump. The biggest useful power can be achieved by optimization of the ratio of pressure losses and internal leakage in hydraulic drive components to the power consumption of the cooling system in order to provide rational temperature of the working liquid. Using rational temperature mode is a reasonable and unused reserve of energy saving and increasing efficiency of running hydraulic drives of mobile machines.
Keywords: *construction machine, hydraulic drive, energy saving, useful power, rational temperature regime.*

УДК 621.87
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DETERMINATION OF THE VALUE OF LIFTING ON A TOOTH BROACH FOR CUTTING THE SEMICIRCULAR GROOVES UNDER THE CONDITION OF UNIFORM TEETH LOADING

The dependencies to determine the value of lifting on the tooth broach for cutting the semicircular grooves under the conditions of uniform teeth loading to provide the stability of cutting process are developed. The dependences to determine the value of cutting by single tooth broach are developed as well.
Keywords: *broach, value of cutting, load, grooves, teeth.*

УДК 621.762.53
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MODELING OF THE HOT PRESSING OF ZrO2 POWDER

The algorithm of the simulation of hot pressing ZrO_2, which based on an Ashby model for the HIP was considered. And maps of hot pressing ZrO_2 powders designed and allow us to find the pressure and temperature of the process HP to obtain the relative density □ = 1,0 at different times.
Keywords: *zirconium dioxide, nanopowders, hot-pressing.*

УДК 621.65
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COMBINED EFFICIENCY OF DIAMOND GRINDING POLYCRYSTALLINE SUPERFIRM MATERIALS

It is known that the most effective method of surface treatment, diamond grinding, but it is known that the quality of the surface depends on the quality of surface preparation of cutting tools. For the surface preparation of these unique for its physical and mechanical properties of materials, you must use the combined process facilities in continuous electrochemical control surface conductive coke in the autonomous zone. This process has a pretty wide technological possibility that allows you to suggest a still undisclosed, his potential.
Keywords: *polycrystalline super hard materials, polycrystalline diamond on superhard materials, edge tools.*

УДК 621.914.1
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CALCULATION OF OPTIMUM CONDITIONS FOR MILLING END MILLS AND FACE MILLS FOR CNC MACHINES WITH A CONSTANT AMOUNT OF CUT MATERIAL PER UNIT OF TIME

Methodology is given in calculating software module «Turbo_Profile.Section _30» relationship between: the number of captured metal per unit time, the parameters of cutter, angle cutter attack in the processing step of processing between passes, thickness of layer, trimmed and cutting conditions. This calculation requires the preparation of programs for CNC machines for processing mode with time constant volume of footage for sustainable harvesting (the load on the tool) and optimal (time processing) milling parts. The specified mode is effective for milling roughing treatment details when skim layer thickness can vary significantly.
Keywords*: turbine shoulder-blade, milling, mode of treatment, technology, program, machine-tool, management.*

УДК 621.923.02
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TENDENCIES OF TOOL MATERIALS DIAMOND GRINDING TECHNOLOGIES DEVELOPMENT

There are considered the modern directions of the research works directed on achievement of high rates of diamond grinding productivity with qualitative characteristics of processed surfaces saving.
Keywords: *diamond grind, the high efficiency, the combined technologies, tool materials, quality of a surface.*

УДК 624.131.35
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NUMERICAL MODELING OF SOIL CEMENT ELEMENTS DEFLECTED MODE DURING CONE PENETRATION TEST WITH AN EXPANDED

The results of the research and numerical simulation of soil cement – probe tip system's deflected mode during static probing with an expanded tip are provided.
Keywords: *quality control, soil cement, static probing with an expanded tip, modeling.*

УДК 621.9.048
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A NEW IN DESIGNING OF TECHNOLOGICAL EQUIPMENT FOR FINISHING-GRINDING VIBRATION TREATMENT OF COMPLEX-PROFILED PARTS

The informative-analytical data and theoretical prognosis of designing of technological equipment for finishing-grinding vibration treatment of complex-profiled parts are presented. The principal chart of the new vibration machine is developed, the methodology of its starting and the technological regulations of executing the operations of finishing-grinding vibration treatment are described.
Keywords: *complex-profiled parts, vibration treatment, fine-grained working medium, vibration machine, prognosis of designing, methodology of starting, technological regulations.*

УДК 621.7
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EXPERIENCE IN DEVELOPING PRODUCTS MANUFACTURING TECHNOLOGY «MEMORABLE SIGN» METHOD OF METAL FORMING

The articles describes one of the ways of making «The memorial sign» by creating a model in CAD system and then implement it in reality by cold forming. We look at the steps of designing a mathematical model of the system ArtCAM, and then punch the consistent implementation of the system matrix for the production of commemorative medals Baltic State Technical University «VOENMECH».
Keywords: *mathematical model, manufacturing process, photo mask, photopolymer,punch-die, stamping.*

УДК 621.9.048
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ANALYTICS OF APPLYING METHOD OF SURFACE PLASTIC DEFORMATION ON THE OPERATIONS OF HARDENING OF PARTS IN GENERAL MACHINE-BUILDING INDUSTRIES

An analytical review of processing of parts by surface plastic deformation is presented. The statistical data of increase of the hardness of various steels, and the graphical dependence for determining depth of the cold-hardened layer, residual stresses, micro-hardness of carbon steels with different structures are given. Advisability and possibility of applying of vibration treatment on operations of hardening of surface layer of parts are shown.
Keywords: *analytics, hardening, surface plastic deformation, hardness, residual stresses, vibration treatment, the amplitude of oscillation, the technology of vibrational hardening.*

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APPLICATION OF COMPUTER SYSTEMS ARTCAM TO DESIGN AND PRODUCTION TECHNOLOGICAL TRAINING OF COAT OF ARMS POLTNTU

The article focuses on the application in the teaching process capabilities of geometric modeling design decorative relief then calculating the trajectory milling on CNC machines using ArtCAM Pro software from the company Delcam plc.
Keywords*: Vector, decorative 3D relief, combined relief, import, visualization.*

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