

SATURS CONTENTS

Engineering Sciences and Production Technologies

Krasimir Ambarev, Stiliyana Taneva STUDY OF THE INFLUENCE OF ROAD RESISTANCE ON THE FUEL CONSUMPTION OF A PASSENGER CAR WITH AN AUTOMATIC TRANSMISSION	15
Krasimir Ambarev, Valyo Nikolov EXPERIMENTAL STUDY OF TOXIC COMPONENTS IN THE EXHAUST GASES DURING THE OPERATION OF A CAR ENGINE WITH GASOLINE AND LPG	20
Valentin Anguelov THERMAL CHARACTERISTICS OF MATERIALS IN MODELLING OF WELDING PROCESSES	24
Valeri Bakardzhiev, Sabi Sabev, Konstantin Chukalov, Plamen Kasabov RESEARCH INTO THE ACCURACY OF HOLES IN 3D PRINTING USING TAGUCHI METHOD	36
Valeri Bakardzhiev, Sabi Sabev, Plamen Kasabov, Konstantin Chukalov RESEARCH INTO 3D PRINTING LAYER ADHESION IN ABS MATERIALS	41
Vitaly Beresnevich, Marina Cerpinska, Martins Irbe, Janis Viba CONVEYOR-TYPE SMALL HYDROPOWER PLANT FOR SHALLOW RIVER WATERS	46
Oleksandr Byzkrovnyi, Kyrylo Smelyakov, Anastasiya Chupryna, Loreta Savulioniene, Paulius Sakalys COMPARISON OF POTENTIAL ROAD ACCIDENT DETECTION ALGORITHMS FOR MODERN MACHINE VISION SYSTEM	50
Ervins Blumbergs, Viktors Mironovs, Genadijs Sahmenko COMPARATIVE STUDIES OF THE STRENGTH CHARACTERISTICS OF CONCRETE BLOCKS WITH TITANIUM AND IRON RODS (BARS)	56
Genadi Cvetanov, Tsanko Karadzhov OPTICAL GEOMETRIC DESIGN OF SMALL MODULAR CYLINDRICAL GEARS WITH ASYMMETRIC PROFILE	61
Vladlen Devin, Serhii Yermakov, Oleg Gorbovy, Vitaliy Pidlisnyj, Oleksandr Semenov RESEARCH ON WORKING BODIES OF HAMMER CRUSHERS EMPLOYING THE FINITE ELEMENT METHOD	65

Vanya Dyakova, Hristina Spasova, Yoanna Kostova, Yana Mourdjeva, Georgi Stefanov	69
EFFECT OF CU AS MINORITY ALLOYING ELEMENT ON GLASS FORMING ABILITY AND CRYSTALLIZATION BEHAVIOR OF RAPIDLY SOLIDIFIED AL-SI-NI RIBBONS	
Vanya Dyakova, Yoanna Kostova, Hristina Spasova	74
INFLUENCE OF NI AS MINORITY ALLOYING ELEMENT ON THE CORROSION BEHAVIOR OF AMORPHOUS AL-CU-MG ALLOYS IN CHLORIDE SOLUTION	
Boyan Dochev, Desislava Dimova, Ivan Panov	79
INVESTIGATING THE POSSIBILITY OF ALLOYING AN ALLOY ALSI25CU5CR WITH CO, CR AND MO USING METAL POWDER	
Boyan Dochev, Desislava Dimova, Mihail Zagorski, Plamen Kasabov, Georgiya Kamburova	83
INVESTIGATION OF THE STRUCTURE OF ALSI25CU4CR AND ALSI25CU5CR ALLOYS	
Nikolay Todorov Dolchinkov	90
RESULTS AND ANALYSIS OF ACHIEVED JOINT RESEARCH AND ACTIVITIES BETWEEN REZEKNE ACADEMY OF TECHNOLOGY AND VASIL LEVSKI NATIONAL MILITARY UNIVERSITY	
Veselina Dukova, Roussi Minev, Emil Yankov	94
STUDY OF TECHNOLOGICAL CHAINS FOR RAPID PROTOTYPING OF ORTHODONTIC DENTAL PRODUCTS	
Deyan Gradinarov, Marina Manilova, Manahil Tongov	99
EXPERIMENTAL REMOTE DETERMINATION OF THE STATIC CHARACTERISTIC OF THE ARC IN TIG WELDING	
Georgi Iliev, Hristo Hristov	106
MODELLING AND SIMULATION OF ELECTROPNEUMATIC POSITIONING SYSTEM INCLUDING THE LENGTH OF PNEUMATIC LINES	
Georgi Iliev, Hristo Hristov	112
MODELLING AND SIMULATION OF DYNAMIC PROCESSES OF PNEUMATIC LINES	
Julieta Kaleicheva, Krassimir Kirov, Valentin Mishev, Rumyana Lazarova, Zdravka Karaguiozova	119
EFFECT OF BORON ON THE WEAR BEHAVIOR OF HIGH CHROMIUM WHITE CAST IRONS	
Karunamoorthy Rengasamy Kannasthan, Andrejs Krasnikovs, Arturs Macanovskis	124
INGREDIENTS DEGRADATION IN STEEL FIBER REINFORCED CONCRETE AFTER THERMAL LOADING	
Pavlinka Katsarova, Kliment Georgiev, Adelina Vasileva, Marin Dimitrov	129
DESIGN AND PRODUCTION OF A DEVICE FOR BASING AND FIXING CONIC DETAILS IN SINE BAR MEASUREMENTS	

Evgeni Lyubomirov Kehayov, Georgi Borisov Ivanov, Georgi Georgiev Komitov 3D MODEL OF THE MECHANICAL PART OF A WEED RECOGNITION SYSTEM IN AN AGRICULTURAL ROBOT IN 3D EXPERIENCE ENVIRONMENT	135
Christo Kondoff, Rossen Mikhov, Leoneed Kirilov, Radostina Zaekova, Plamen Tashev WORKING REGIMES FOR FRICTION STIR PROCESSING OF ALUMINIUM ALLOY A6061	139
Angel Lengerov, Sabi Sabev, Stoyan Paliiski EXPERIMENTAL STUDY OF SURFACE ROUGHNESS IN VIBRO-IMPACT CUTTING OF OPTICAL SLUGS	145
Angel Lengerov, Kalin Krumov, Georgi Levicharov STUDY OF THE KINEMATIC AND DYNAMIC OF INTERACTION OF A VIBRATING SYSTEM FOR CUTTING OPTICAL SLUGS	149
Dimilyan Leonov, Angel Lengerov, Kalin Krumov, Hristo Metev INCREASING THE QUALITY OF FORMING OF SPINNING DETAILS OF ALUMINUM ALLOYS BY CONTROLLING THE RESIDUAL STRESSES IN THEIR SURFACE LAYER	154
Dimilyan Leonov, Hristo Metev, Kalin Krumov, Angel Lengerov SOLVING FUNCTIONAL-TECHNOLOGICAL PROBLEMS USING A NON- PARAMETRIC APPROACH FOR CONTROL OF MICROGEOMETRY OF THE SURFACES OF DETAILS	159
Georgi Levicharov, Angel Lengerov, Stoyan Paliiski STUDY ABOUT THE INFLUENCE OF THE PROCESS PARAMETERS OF VIBRO IMPACT CUTTING OF OPTICAL SLUGS ON THE PRODUCTIVITY OF THE PROCESS	164
Marin Jordanov Marinov A GEOMETRICAL SYNTHESIS OF COMEZ TEXTILE MECHANISMS OF FINALLY REMOVED POSSIBILITIES	168
Vaidotas Matutis, Loreta Savulioniene, Paulius Sakalys, Laura Gzegozevske RESEARCH OF THE PRINCIPAL MODEL OF THE ELECTRIC ENERGY GENERATOR OF THE ELECTRIC CAR (STAGE COMBINATION OF MECHANICAL AND ELECTROMECHANICAL PARTS)	172
Ruta Meiste, Sandra Jakštienė, Aušra Lankauskienė IMPROVEMENT OF OPERATIONAL PROCESSES BY ENSURING WORK SAFETY IN PRODUCTION	176
Ivan Mitev, Simeon Tsenkulovski LOCAL PROCESSING OF NON-METAL MATERIALS WITH CONCENTRATED ENERGY FLOW	183

Neli Nikolova HUMAN CAPITAL IN THE CHANGING WORK ENVIRONMENT OF INDUSTRY 4.0	187
Oleksandra Orda, Yevgen Nagornyy, Natalia Potaman APPROACH TO THE FORMING OF RATIONAL TECHNOLOGY FOR THE EXPORT CARGOES DELIVERY IN SUPPLY CHAIN ON THE PRINCIPLES OF CO- MODALITY	194
Angel Poparov, Agop Izmirliq CHARACTERISTICS OF MOVEMENTS WHEN CYLINDRICAL TURNING, DRILLING, COREDRILLING AND REAMING	200
Angel Poparov, Agop Izmirliq CHARACTERISTICS OF MOTIONS IN FACING	204
Dimcho Pulov, Tsanko Karadzhov DEVELOPMENT OF A METHOD FOR CONTACTLESS TEMPERATURE MEASUREMENT IN 3 SPECTRAL RANGES	208
Sabi Sabev, Plamen Kasabov, Konstantin Chukalov, Valeri Bakardzhiev INFLUENCE OF ADDING POLYPROPYLENE(PP) INTO POLYETHYLENE(PE) ON MECHANICAL PROPERTIES OF GEOCELLS	214
Sabi Sabev, Plamen Kasabov, Konstantin Chukalov, Valeri Bakardzhiev DETERMINATION OF THE DYNAMIC MODULUS OF LINEAR DEFORMATIONS OF REINFORCED HIGHLY FILLED POLYMER CONCRETE COMPOSITES DURING CURING	219
Silviya Salapateva, Iliya Chetrokov, Bano Stefanov ALGORITHM FOR OPTIMIZATION OF IDLE TOOL MOVES WHEN MILLING COMPLEX SURFACES ON A TRIAXIAL CNC MILLING MACHINE	226
Silviya Salapateva, Bano Stefanov MATHEMATICAL MODELING OF THE SEQUENCE OF MACHINING SECTIONS OF COMPLEX SURFACES WHEN MILLING ON A TRIAXIAL CNC MACHINE TOOL	233
Silviya Salapateva, Bano Stefanov EXPERIMENTAL STUDIES OF AN ALGORITHM FOR MINIMIZING THE IDLE TOOL MOVES WHEN MILLING COMPLEX SURFACES ON TRIAXIAL CNC MACHINE TOOLS	240
Kyrylo Smelyakov, Anastasiya Chupryna, Denys Sandrkin, Loreta Savulioniene, Paulius Sakalys ADAPTIVE IMAGE ENHANCEMENT MODEL FOR THE ROBOT VISION SYSTEM	246
Stiliyana Taneva, Krasimir Ambarev, Stanimir Penchev, Hristo Atanssov FREQUENCY ANALYSIS OF AN ARM OF MACPHERSON SUSPENSION ON A PASSENGER CAR	252

Manahil Tongov, Valentin Anguelov PRACTICE ORIENTED HEAT SOURCE MODEL CALIBRATION	257
Manahil Tongov, Vladimir Petkov A THERMAL MODEL FOR WIRE ARC ADDITIVE MANUFACTURING	262
Serhii Yermakov, Taras Hutsol, Igor Gerasymchuk, Pavlo Fedirko, Viktor Dubik STUDY OF THE UNLOADING AND SELECTION PROCESS OF ENERGY WILLOW CUTTINGS FOR THE CREATION A PLANTING MACHINE	271
Radostina Zaekova, Plamen Tashev, Yasen Hadjitodorov, Deyan Gradinarov MODIFICATION OF 5083 ALUMINUM ALLOY WITH GRAPHENE VIA FRICTION STIR PROCESSING	276

Laser Technologies

Kevins Bulavskis, Emil Yankov, Lyubomir Lazov, Antons Pacejs RESEARCHING THE PROCESS OF LASER STRUCTURING OF THE SURFACE OF ALUMINUM	282
Љubova Denisova, Antons Pacejs, Emil Yankov, Lyubomir Lazov ANALYSING THE INFLUENCE OF TECHNOLOGICAL PARAMETERS ON THE PROCESS OF LASER MARKING OF SURFACE OF ANODISED ALUMINIUM SAMPLES	289
Nikolay Todorov Dolchinkov, Teodor Petrov, Georgi Petrov, Christian Tolev, Emanuil Dimitrov FEATURES OF COLOR LASER MARKING ON METALS	297
Borislav Georgiev, Tsanko Karadzhov COMPARATIVE ANALYSIS OF GEOMETRIC DEVIATIONS IN CONTACT MEASURING INSTRUMENTS FOR CONTROL AND LASER CONTACTLESS SCANNING	306
Veselin Hristov, Lyubomir Lazov, Nikolay Angelov, Emil Yankov INFLUENCE OF BASIC PARAMETERS OF THE LASER MARKING PROCESS ON STAINLESS STEEL SAMPLES	311
Tsanko Karadzhov, Lyubomir Lazov COMPARATIVE ANALYSIS OF METHODS FOR MEASURING LASER POWER	316
Jēkabs Lapa, Imants Adijāns, Emil Yankov, Lyubomir Lazov, Ritvars Rēvalds INVESTIGATION OF LASER MARKING AND TEXTURING OF TITANIUM GR 2 WITH FIBER LASER	321
Lyubomir Lazov, Ivo Draganov APPLICATION OF A FINITE ELEMENT MODEL TO OBTAIN THE INFLUENCE OF THE TREATMENT'S POWER, REFLECTION AND FOCAL DIAMETER IN LASER TEXTURING OF ALUMINUM	328

Lyubomir Lazov, Nikolay Padarev, Milko Yovchev, Lyubomir Linkov THE CHANGE OF CONTRAST IS INVESTIGATION OF 75 STEEL SAMPLES LASER MARKED WITH DIFFERENT MODES	334
Dimcho Pulov, Petar Tsvyatkov OPTICAL SYSTEMS FOR REDUCING THE DIVERGENCE OF LASER BEAMS	339
Daniels Raubiška, Imants Adijāns, Emil Yankov, Lyubomir Lazov INVESTIGATING THE CONTRAST OF SURFACE MARKING ON DIFFERENT COLOR CONNECTORS FOR TELECOMMUNICATIONS NEEDS	344
Dzintars Rāviņš, Emil Yankov, Imants Adijāns, Lyubomir Lazov, Daivis Rāviņš INVESTIGATING THE IMPACT OF LASER POWER AND SCAN SPEED ON ENGRAVING ASPEN THERMOWOOD	351
Petar Tsvyatkov, Emil Yankov, Lyubomir Lazov, Edmunds Teirumnieks, Karlis Pīgožnis INVESTIGATION OF SURFACE ROUGHNESS OF CARBON STEEL MACHINED PARTS AFTER NANOSECOND FIBER LASER MARKING	358
Petar Tsvyatkov, Emil Yankov, Lyubomir Lazov, Edmunds Teirumnieks, Erika Teirumnieka COLOR MARKING OF STAINLESS STEEL AND TITANIUM WITH THE LASER OXIDATION METHOD	363
Petar Tsvyatkov, Emil Yankov, Lyubomir Lazov, Edmunds Teirumnieks, Karlis Pīgožnis INVESTIGATION OF THE INFLUENCE OF TECHNOLOGICAL PARAMETERS OF LASER MARKING ON THE DEGREE OF CONTRAST	370