

International Conference on Energy, Environment and Material Systems (EEMS 2017)

E3S Web of Conferences Volume 19 (2017)

Polanica-Zdroj, Poland
13 - 15 September 2017

Editors:

**Malgorzata Wzorek
Grzegorz Krolczyk
Anna Krol**

ISBN: 978-1-5108-5009-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

This work is licensed under a Creative Commons Attribution license:
<http://creativecommons.org/licenses/by/2.0/>

You are free to:

Share – copy and redistribute the material in any medium or format.

Adapt – remix, transform, and build upon the material for any purpose, even commercial.

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

You must give appropriate credit, provide a link to the license, and indicate if changes were made.

You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. The copyright is retained by the corresponding authors.

Printed by Curran Associates, Inc. (2017)

For additional information, please contact EDP Sciences – Web of Conferences
at the address below.

EDP Sciences – Web of Conferences
17, Avenue du Hoggar
Parc d'Activité de Courtabœuf
BP 112
F-91944 Les Ulis Cedex A
France

Phone: +33 (0) 1 69 18 75 75

Fax: +33 (0) 1 69 28 84 91

contact-edps@webofconferences.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

COMPARISON OF LOW FREQUENCY SIGNALS EMITTED BY WIND TURBINES OF TWO DIFFERENT GENERATOR TYPES	1
<i>Malec Tomasz, Boczar Tomasz, Wotzka Daria, Fracz Pawel</i>	
STATISTICAL ANALYSIS OF THE ELECTRIC ENERGY PRODUCTION FROM PHOTOVOLTAIC CONVERSION USING MOBILE AND FIXED CONSTRUCTIONS	8
<i>Bugala Artur, Bednarek Karol, Kasprzyk Leszek, Tomczewski Andrzej</i>	
DETERMINATION OF THE NUMBER OF VERTICAL AXIS WIND TURBINE BLADES BASED ON POWER SPECTRUM	14
<i>Fedak Waldemar, Anweiler Stanislaw, Gancarski Wojciech, Ulbrich Roman</i>	
ANALYSIS OF WIND ENERGY GENERATION POSSIBILITIES WITH VARIOUS ROTOR TYPES AT DISADVANTAGEOUS WIND CONDITION ZONES	20
<i>Bieniek Andrzej</i>	
INVESTIGATION OF IRREGULARITY OF FLOW DISTRIBUTION ACROSS THE TUBE BUNDLE IN SHELL-AND-TUBE HEAT EXCHANGER WITH SEGMENTAL BAFFLES USING PIV METHOD	26
<i>Ligus Grzegorz, Kolodziej Szymon</i>	
CHARACTERIZATION AND INTEGRATION OF OXIDATION CATALYSTS AT SMALL-SCALE BIOMASS COMBUSTION FURNACES	34
<i>Matthes Mirjam, Hartmann Ingo, Schenk Joachim, Enke Dirk</i>	
PROJECTED CONFIGURATION OF A COAL-FIRED DISTRICT HEATING SOURCE ON THE BASIS OF COMPARATIVE TECHNICAL-ECONOMICAL OPTIMIZATION ANALYSIS	40
<i>Tanczuk Mariusz, Radziewicz Wojciech, Olszewski Eligiusz, Skorek Janusz</i>	
CO-FIRING COAL AND BIOMASS BLENDS AND THEIR INFLUENCE ON THE POST-COMBUSTION CO₂ CAPTURE INSTALLATION	49
<i>Wieckol-Ryk Angelika, Smolinski Adam</i>	
TECHNICAL AND ENVIRONMENTAL PERFORMANCE OF 10 KW UNDERSTOCKER BOILER DURING COMBUSTION OF BIOMASS AND CONVENTIONAL FUELS	55
<i>Junga Robert, Wzorek Malgorzata, Kaszubska Miroslawa</i>	
SORPTION CHARACTERISTIC OF COAL AS REGARDS OF GAS MIXTURES EMITTED IN THE PROCESS OF THE SELF-HEATING OF COAL	63
<i>Wojtacha-Rychter Karolina, Smolinski Adam</i>	
COMPARATIVE ANALYSIS OF HEAT PUMP AND BIOMASS BOILER FOR SMALL DETACHED HOUSE HEATING	69
<i>Olkowski Tomasz, Lipinski Seweryn, Oledzka Aneta</i>	
ANALYSIS OF THE EFFICIENCY OF A HYBRID FOIL TUNNEL HEATING SYSTEM	75
<i>Kurpaska Slawomir, Pedryc Norbert</i>	
POSSIBILITY OF REDUCING CO₂ EMISSIONS FROM INTERNAL COMBUSTION ENGINES	79
<i>Drabik Dawid, Mamala Jaroslaw, Smieja Michal, Praznowski Krzysztof</i>	
THE EFFICIENCY OF THE HEAT PUMP WATER HEATER, DURING DHW TAPPING CYCLE	83
<i>Guzda Arkadiusz, Szmolke Norbert</i>	
THE MICROCLIMATE PARAMETERS CHANGE IN THE OCCUPIED ZONE INSIDE SOME LARGE-VOLUME BUILDINGS WITH SIGNIFICANT INFLUENCE OF THE HEAT EMISSION FROM PEOPLE STAYING INSIDE	89
<i>Albert Jelec Pawel</i>	
A NUMERICAL ANALYSIS OF METROLOGICAL PROPERTIES OF VENTURI TUBE IN THE AIR-COAL PARTICLE MIXTURE FLOW MEASUREMENT IN POWER INDUSTRY	97
<i>Borsuk Grzegorz, Dobrowolski Boleslaw, Wydnych Jacek</i>	
VISUAL STUDY OF CAPABILITIES OF MANAGING IC ENGINE FILLING DEGREE VS ENGINE ECOLOGICAL INDICATORS	103
<i>Kolodziej Szymon, Ligus Grzegorz</i>	
SIMULATION OF FUEL DEMAND FOR WOOD-GAS IN COMBUSTION ENGINE	109
<i>Botwinska Katarzyna, Mruk Remigiusz, Tucki Karol, Wata Mateusz</i>	
POSSIBILITY OF DIRECT ELECTRICITY PRODUCTION FROM WASTE CANOLA OIL	115
<i>Wlodarczyk Pawel P., Wlodarczyk Barbara, Kalinichenko Antonina</i>	
SMALL PHOTOVOLTAIC SETUP FOR THE AIR CONDITIONING SYSTEM	119
<i>Masiukiewicz Maciej</i>	

HEAT DEMAND MAPPING AND DISTRICT HEATING GRID EXPANSION ANALYSIS: CASE STUDY OF VELIKA GORICA	125
<i>Dorotic Hrvoje, Novosel Tomislav, Duic Neven, Pukšec Tomislav</i>	
THERMAL ENERGY STORAGE IN GRANULAR DEPOSITS.....	131
<i>Ratuszny Pawel</i>	
ESTIMATION OF THE COST OF ELECTRO-MECHANICAL EQUIPMENT FOR SMALL HYDROPOWER PLANTS – REVIEW AND COMPARISON OF METHODS.....	137
<i>Lipinski Seweryn, Olkowski Tomasz</i>	
INTERNAL HEAT GAIN FROM DIFFERENT LIGHT SOURCES IN THE BUILDING LIGHTING SYSTEMS	141
<i>Suszanowicz Dariusz</i>	
SINGLE CHAMBER MICROBIAL FUEL CELL WITH NI-CO CATHODE.....	146
<i>Włodarczyk Barbara, Włodarczyk Pawel P., Kalinichenko Antonina</i>	
HEAT TRANSFER COEFFICIENT AS PARAMETER DESCRIBING ABILITY OF INSULATING LIQUID TO HEAT TRANSFER	150
<i>Nadolny Zbigniew, Goscinski Przemyslaw, Bródka Boleslaw</i>	
ANALYSIS OF POWER AND ENERGY LOSSES IN POWER SYSTEMS OF ELECTRIC BUS BATTERY CHARGING STATIONS.....	154
<i>Jajczyk Jaroslaw, Dobrzycki Arkadiusz, Filipiak Michal, Kurz Dariusz</i>	
ONLINE IDENTIFICATION OF WIND MODEL FOR IMPROVING QUADCOPTER TRAJECTORY MONITORING	158
<i>Beniak Ryszard, Gudzenko Oleksandr</i>	
THE COMPUTER DIAGNOSTIC PROGRAM (DIAG 2) FOR IDENTIFYING STATES OF COMPLEX TECHNICAL OBJECTS.....	162
<i>Duer Stanislaw, Bernatowicz Dariusz</i>	
MINIMISATION OF THE LCOE FOR THE HYBRID POWER SUPPLY SYSTEM WITH THE LEAD-ACID BATTERY	168
<i>Kasprzyk Leszek, Tomczewski Andrzej, Bednarek Karol, Bugala Artur</i>	
NEW APPROACH TO WIRELESS DATA COMMUNICATION IN A PROPAGATION ENVIRONMENT	174
<i>Hunek Wojciech P., Majewski Pawel</i>	
APPLICATION OF NUMERICAL MODEL OF THE PHOTOVOLTAIC MODULE TO THE PRACTICAL COMPARATIVE ANALYSIS	178
<i>Krzesimowski Damian, Pawelec Artur</i>	
AN INNOVATIVE HYBRID INSULATION SWITCH TO ENABLE/DISABLE ELECTRICAL LOADS WITHOUT OVERVOLTAGES	186
<i>Zajkowski Konrad</i>	
THE ASSESSMENT OF EXPLOITATION PROCESS OF POWER FOR ACCESS CONTROL SYSTEM.....	191
<i>Wisnios Michal, Pas Jacek</i>	
COMPARISON OF CAPACITIVE AND INDUCTIVE SENSORS DESIGNED FOR PARTIAL DISCHARGES MEASUREMENTS IN ELECTRICAL POWER APPARATUS.....	196
<i>Kunicki Michal</i>	
NEW APPROACHES TO MINIMUM-ENERGY DESIGN OF INTEGER- AND FRACTIONAL-ORDER PERFECT CONTROL ALGORITHMS.....	201
<i>Hunek Wojciech P., Wach Lukasz</i>	
SETTLEMENT OF REACTIVE POWER COMPENSATION IN THE LIGHT OF WHITE CERTIFICATES	206
<i>Zajkowski Konrad</i>	
CREATING OF STRUCTURE OF FACTS FOR THE KNOWLEDGE BASE OF AN EXPERT SYSTEM FOR WIND POWER PLANT'S EQUIPMENT DIAGNOSIS	212
<i>Duer Stanislaw, Wrzesien Pawel, Duer Radoslaw</i>	
ANALYSIS OF THE IMPACT OF THERMAL RESISTANCE OF THE ROOF ON THE PERFORMANCE OF PHOTOVOLTAIC ROOF TILES.....	218
<i>Kurz Dariusz, Nawrowski Ryszard</i>	
THERMAL PROPERTIES OF MIXTURES OF MINERAL OIL AND NATURAL ESTER IN TERMS OF THEIR APPLICATION IN THE TRANSFORMER	224
<i>Nadolny Zbigniew, Dombek Grzegorz</i>	
INFLUENCE OF THE POWER SUPPLY PARAMETERS ON THE PROJECTILE ENERGY IN THE PERMANENT MAGNET ELECTRODYNAMIC ACCELERATOR.....	230
<i>Waindok Andrzej, Piekilny Pawel</i>	

MATHEMATICAL MODEL OF OPTICAL SIGNALS EMITTED BY ELECTRICAL DISCHARGES OCCURRING IN ELECTROINSULATING OIL	236
<i>Koziol Michal</i>	
NOISE VARIANCE ESTIMATION FOR KALMAN FILTER	242
<i>Beniak Ryszard, Gudzenko Oleksandr, Pyka Tomasz</i>	
COMPARATIVE ANALYSIS OF CELLULOSE PRESSBOARD AND ARAMID PAPER USED IN AIR INSULATION SYSTEMS OF HIGH-VOLTAGE DEVICES	246
<i>Turba Tomasz, Fracz Pawel</i>	
DETECTION OF IONIZING RADIATION GENERATED BY ELECTRICAL DISCHARGES IN THE AIR USING SPHERE-SPHERE SYSTEM	250
<i>Nagi Lukasz</i>	
AIR PURIFICATION FROM A MIXTURE VOCS IN THE PILOT-SCALE TRICKLE-BED BIOREACTOR (TBB)	254
<i>Sarzynski Rafal, Gaszczak Agnieszka, Janecki Daniel, Bartelmus Grazyna</i>	
INFLUENCE OF CALCINATION PROCESS ON THE FORMATION OF SELECTED AIR POLLUTANTS	258
<i>Wydrych Jacek, Dobrowolski Boleslaw, Borsuk Grzegorz, Pochwala Slawomir</i>	
SIMULATION OF DIESEL ENGINE EMISSIONS ON THE EXAMPLE OF FIAT PANDA IN THE NEDC TEST	264
<i>Botwinska Katarzyna, Mruk Remigiusz, Sloma Jacek, Tucki Karol, Zaleski Mateusz</i>	
PARTICULATE MATTER IN THE RURAL SETTLEMENT DURING WINTER TIME	270
<i>Olszowski Tomasz</i>	
UNMANNED AERIAL VEHICLES FOR ENVIRONMENTAL MONITORING WITH SPECIAL REFERENCE TO HEAT LOSS	276
<i>Anweiler Stanislaw, Piwowarski Dawid, Ulbrich Roman</i>	
AEROSOL IN SELECTED LABORATORIES AT FACULTY OF MECHANICAL ENGINEERING, OPOLE UNIVERSITY OF TECHNOLOGY	280
<i>Olszowski Tomasz</i>	
CALIBRATION OF PARAMETERS OF WATER SUPPLY NETWORK MODEL USING GENETIC ALGORITHM	284
<i>Boczar Tomasz, Adamikiewicz Norbert, Stanislawski Wlodzimierz</i>	
THE REMOVAL OF CHLORAMPHENICOL FROM WATER THROUGH ADSORPTION ON ACTIVATED CARBON	288
<i>Lach Joanna, Ociepa-Kubicka Agnieszka</i>	
ANALYSIS OF FACTORS AFFECTING THE ECOLOGICAL STATUS OF THE LARGE WATER BODIES ON THE BASIS OF MONITORING AND INTEGRATED 3D MODELS	293
<i>Zbicinski Ireneusz, Zieminska-Stolarska Aleksandra</i>	
MODEL OF GEOTHERMAL WATER DEIRONING ON THE BASIS OF A TRIANGULATION	301
<i>Klosok-Bazan Iwona, Olszewski Robert</i>	
VISCOSITY OF DILUTED SUSPENSIONS OF VEGETAL PARTICLES IN WATER	305
<i>Szydlowska Adriana, Hapanowicz Jerzy</i>	
LONG-TERM TRENDS IN RIVER FLOW: A CASE STUDY OF THE SOLA RIVER (POLISH CARPATHIANS)	309
<i>Kedra Mariola</i>	
EXAMINATION OF COAGULANT ADDITIVES ON QUALITATIVE COMPOSITION OF SELECTED THERMAL WATERS	315
<i>Lukasiewicz Ewelina, Rzasa Mariusz</i>	
ANALYSIS OF WASTEWATER TREATMENT EFFICIENCY IN A SOFT DRINKS INDUSTRY	319
<i>Boguniewicz-Zablocka Joanna, Capodaglio Andrea G., Vogel Daniel</i>	
WATER LOSS REDUCTION AS THE BASIS OF GOOD WATER SUPPLY COMPANIES' MANAGEMENT	325
<i>Ociepa-Kubicka Agnieszka, Wilczak Krzysztof</i>	
LONG-TERM TRENDS IN RIVER WATER TEMPERATURE: A CASE STUDY OF THE RABA RIVER (POLISH CARPATHIANS)	330
<i>Kedra Mariola</i>	
ASSESSMENT OF APPLICATION OF SELECTED WASTE FOR PRODUCTION OF BIOGAS	337
<i>Pawlita-Posmyk Monika, Wzorek Malgorzata</i>	
THE STUDY OF HEAVY METALS LEACHING FROM WASTE FOUNDRY SANDS USING A ONE-STEP EXTRACTION	343
<i>Bozym Marta</i>	

LEACHING OF HEAVY METALS FROM CEMENTITIOUS COMPOSITES MADE OF NEW TERNARY CEMENTS.....	349
<i>Kuterasinaska-Warwas Justyna, Król Anna</i>	
ENVIRONMENTAL ASSESSMENT OF APPLICABILITY OF MINERAL-ORGANIC COMPOSITE FOR LANDFILL AREA REHABILITATION.....	357
<i>Mizerna Kamila, Król Anna, Mróz Adrian</i>	
ENVIRONMENTAL, TECHNICAL AND TECHNOLOGICAL ASPECTS OF HAZARDOUS WASTE MANAGEMENT IN POLAND.....	361
<i>Pyssa Justyna</i>	
SUSTAINABLE AGRICULTURE AND PROTECTION OF THE ENVIRONMENT.....	370
<i>Siemianowska Ewa, Wesolowski Andrzej, Skibniewska Krystyna A., Tyburski Józef, Gurzynski Marcin</i>	
ENVIRONMENTAL COSTS RESULTING FROM THE USE OF HARD COAL TO ELECTRICITY GENERATION IN POLAND.....	378
<i>Stala-Szlugaj Katarzyna, Grudzinski Zbigniew</i>	
THE INFLUENCE OF SHALE GAS MINING ACTIVITIES ON THE NATURAL ENVIRONMENT IN POLAND.....	384
<i>Pyssa Justyna</i>	
ANALYSIS OF MUNICIPAL WASTE GENERATION RATE IN POLAND COMPARED TO SELECTED EUROPEAN COUNTRIES.....	392
<i>Klojzy-Karczmarczyk Beata, Makoudi Said</i>	
EFFECT OF REPLACEMENT OF TIN DOPED INDIUM OXIDE (ITO) BY ZNO: ANALYSIS OF ENVIRONMENTAL IMPACT CATEGORIES.....	398
<i>Zieminska-Stolarska Aleksandra, Barecka Magda, Zbicinski Ireneusz</i>	
ECO-BALANCE ANALYSIS OF THE DISUSED LEAD-ACID-BATTERIES RECYCLING TECHNOLOGY.....	402
<i>Kaminska Ewa, Kaminski Tomasz</i>	
ENVIRONMENTAL IMPACT OF GEOTHERMAL POWER PLANTS IN AYDIN, TURKEY.....	407
<i>Yilmaz Ersel, Ali Kaptan Mustafa</i>	
HEALTH-RISK ASSESSMENT BASED ON AN ADDITIVE TO PAINTS MADE FROM ISOBUTYRIC ALDEHYDE CONDENSATION PRODUCTS.....	414
<i>Jan Tic Wilhelm</i>	
ADDITIVES FOR REDUCING THE TOXICITY OF RESPIRABLE CRYSTALLINE SILICA. SILIFE PROJECT.....	422
<i>Monfort Eliseo, López-Lilao Ana, Escrig Alberto, Jesus Ibáñez Maria, Bonvicini Guliana, Creutzenberg Otto, Ziemann Christina</i>	
ENVIRONMENTALLY FRIENDLY PAINT AND VARNISH ADDITIVES BASED ON ISOBUTYRATE ALDEHYDE CONDENSATION PRODUCTS.....	427
<i>Guzialowska-Tic Joanna, Jan Tic Wilhelm</i>	
TECHNICAL EVALUATION OF PHOTOBIOREACTORS FOR MICROALGAE CULTIVATION.....	435
<i>Placzek Malgorzata, Patyna Agnieszka, Witczak Stanislaw</i>	
ENERGY AND EMERGY ANALYSIS OF MIXED CROP-LIVESTOCK FARMING.....	445
<i>Kuczuk Anna, Pospolita Janusz, Wacław Stefan</i>	
THE USE OF QSAR METHODS FOR DETERMINATION OF N-OCTANOL/WATER PARTITION COEFFICIENT USING THE EXAMPLE OF HYDROXYESTER HE-1.....	451
<i>Guzialowska-Tic Joanna</i>	
ENERGY VALUE OF SOIL ORGANIC MATTER AND COSTS OF ITS RESTORATION.....	457
<i>Kuczuk Anna</i>	
SELECTED PROBLEMS OF GAS-LIQUID FLOW THROUGH THE CHANNELS FILLED WITH METAL FOAMS.....	465
<i>Dyga Roman, Placzek Malgorzata</i>	
THE INFLUENCE OF THE INTERNAL MICROBIOME ON THE MATERIALS USED FOR CONSTRUCTION OF THE TRANSMISSION NATURAL GAS PIPELINES IN THE LODZ PROVINCE.....	473
<i>Staniszewska Agnieszka, Jastrzebska Magdalena, Zieminski Krzysztof</i>	
ASSESSMENT OF POROUS MATERIAL ANISOTROPY AND ITS EFFECT ON GAS PERMEABILITY.....	479
<i>Walowski Grzegorz</i>	
FORMING OF FILM SURFACE OF VERY VISCOUS LIQUID FLOWING WITH GAS IN PIPES.....	484
<i>Czernek Krystian, Witczak Stanislaw</i>	
FEATURES OF SINGLE TRACKS IN COAXIAL LASER CLADDING OF A NIBASED SELF-FLUXING ALLOY.....	493
<i>Feldshtein Eugene, Devojno Oleg, Kardapolava Marharyta, Lutsko Nikolaj</i>	

EXPERIMENTAL STUDIES OF THIN FILMS DEPOSITION BY MAGNETRON SPUTTERING METHOD FOR CIGS SOLAR CELL FABRICATION	498
<i>Gulkowski Slawomir, Krawczak Ewelina</i>	
EFFECTS OF HYDROGEN-CHARGING ON THE PROPERTIES OF S235JR STEEL	502
<i>Pietkun-Greber Izabela</i>	
KLINKENBERG EFFECT IN HYDRODYNAMICS OF GAS FLOW THROUGH ANISOTROPIC POROUS MATERIALS	508
<i>Walowski Grzegorz, Filipczak Gabriel</i>	
WEAR OF CARBIDE INSERTS DURING TURNING OF C45 STEEL IN DRY CUTTING CONDITIONS AND IN PRESENCE OF EMULSION MIST	512
<i>Feldshtein Eugene E., Wojciechowski Szymon</i>	
NUMERICAL SIMULATION OF MICRO-CRACK OCCURRING IN PIPE MADE OF STAINLESS STEEL	516
<i>Wotzka Daria</i>	
ELECTRICAL PROPERTIES OF ALUMINUM CONTACTS DEPOSITED BY DC SPUTTERING METHOD FOR PHOTOVOLTAIC APPLICATIONS	520
<i>Krawczak Ewelina, Gulkowski Slawomir</i>	
IMPACT OF FE POWDER SINTERING AND SOLDERING IN PRODUCTION OF POROUS HEATING SURFACE ON FLOW BOILING HEAT TRANSFER IN MINICHANNELS	524
<i>Depczynski Wojciech, Piasecki Artur, Piasecka Magdalena, Strak Kinga</i>	
THE USE OF MODERN MEASUREMENT TECHNIQUES FOR DESIGNING PRO ECOLOGICAL CONSTRUCTIONS	530
<i>Wieczorowski Michal, Gapinski Bartosz, Szymanski Maciej, Rekas Artur</i>	
THE STUDY ON DYNAMIC PROPERTIES OF MONOLITHIC BALL END MILLS WITH VARIOUS SLENDERNESS	536
<i>Wojciechowski Szymon, Tabaszewski Maciej, Krolczyk Grzegorz M., Maruda Radoslaw W.</i>	
EFFECT OF HEAT TREATMENT ON THE FATIGUE LIFE OF STEEL-TITANIUM BIMETAL	542
<i>Kurek Andrzej</i>	
DESIGNING AD HOC TEMPERATURE FIXED POINT CELLS	546
<i>Kochan Orest, Su Jun, Kochan Roman</i>	
VERIFICATION OF NEW MODEL FOR DETERMINING THE CRITICAL PLANE ORIENTATION ANGLE	550
<i>Kurek Marta</i>	
DETERMINATION OF MECHANICAL PROPERTIES OF CARBON/EPOXY PLATES BY TENSILE STRESS TEST	554
<i>Bere Paul, Krolczyk Jolanta B.</i>	
MATERIALS, USED IN HISTORICAL BUILDINGS, ANALYSIS METHODS AND SOLUTIONS PUROPOSALS	558
<i>Döndüren M.Sami, Sisik Ozlem</i>	
SURFACE PHENOMENA ACCOMPANYING PLASMA GOUGING OF S355 STEEL	564
<i>Kalaszniow Anatol, Michalski Mariusz</i>	
COMPUTATIONAL COMPLIANCE CRITERIA IN WATER HAMMER MODELLING	570
<i>Urbanowicz Kamil</i>	
NUMERICAL ANALYSIS OF THE STATES OF STRESS IN THE STEEL-TITANIUM BIMETAL DURING CYCLIC BENDING	578
<i>Robak Grzegorz, Cichanski Artur</i>	
DESIGNING AN ACCURATE SYSTEM FOR TEMPERATURE MEASUREMENTS	583
<i>Kochan Orest, Su Jun, Kochan Roman</i>	
THE USE OF 3D SCANNER FOR TESTING CHANGES IN SHAPE OF HUMAN LIMBS UNDER THE INFLUENCE OF EXTERNAL MECHANICAL LOAD	589
<i>Kasperska Kamila, Wieczorowski Michal, Krolczyk Jolanta B.</i>	
IDENTIFICATION OF INTERNAL DEFECTS OF HARDFACING COATINGS IN REGENERATION OF MACHINE PARTS	593
<i>Józwick Jerzy, Dziedzic Krzysztof, Pashechko Mykhalo, Lukasiewicz Andrzej</i>	
ALSi21CUNI SILUMIN MODIFICATION WITH PHOSPHOR AND STRONTIUM MICRO ADDITIONS	599
<i>Michalski Mariusz, Romankiewicz Ferdynand</i>	
DKJSTARTDKJSTARTEVALUATION OF TRIBOLOGICAL PROPERTIES OF SELECTED ENGINE OILS DURING OPERATION OF THE FRICTION PAIRS OF STEEL-ON-STEEL	605
<i>Barszcz Marcin, Józwick Jerzy, Dziedzic Krzysztof, Stec Kamil</i>	

ANALYTICAL AND ARTIFICIAL NEURAL NETWORK MODELS TO ESTIMATE THE DISCHARGE COEFFICIENT FOR OGEE SPILLWAY	611
<i>Yarar Alpaslan</i>	
TESTING OF CRIMP CONNECTIONS MADE ON A PROTOTYPE STAND	615
<i>Wróbel Nikodem, Rejek Michal, Krolczyk Grzegorz</i>	
BEHAVIOUR OF STRENGTHENED RC FRAMES WITH ECCENTRIC STEEL BRACED FRAMES	620
<i>Kamanli Mehmet, Unal Alptug</i>	
INFLUENCE OF LONG-LASTING HEAT TREATMENTS ON THE STRUCTURE AND PROPERTIES OF THE ZIRCONIUM-STEEL BOND	624
<i>Prazmowski Mariusz, Paul Henryk, Najwer Michal, Pocią Anna</i>	
INVESTIGATION OF THE INFLUENCE OF COOLANT-LUBRICANT MODIFICATION ON SELECTED EFFECTS OF PULL BROACHING	632
<i>Adamczuk Krzysztof, Legutko Stanislaw, Laber Alicja, Serwa Wojciech</i>	
THE MEASUREMENTS OF TEMPERATURE AND DEFORMATIONS OF CAR RADIATORS	637
<i>Peta Katarzyna, Grochalski Karol</i>	
Author Index	