

33rd International Conference on Metallurgy and Materials (METAL 2024)

Brno, Czech Republic
22-24 May 2024

ISBN: 979-8-3313-1244-2

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.

Copyright© (2024) by Tanger Ltd
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact Tanger Ltd
at the address below.

Tanger Ltd
Keltickova 62
710 00 Slezka Ostrava
Czech Republic

www.tanger.cz

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

SESSION A - ADVANCED TECHNOLOGIES IN IRON, STEEL AND FOUNDRY PRODUCTION

THE STEEL DECARBONIZATION IMPROVE SOLUTIONS CONTINUOUS-CASTING GREEN STEEL	12
---	-----------

Paul OLARU

OPTIMIZATION OF PARTIAL STAINLESS STEEL MELT OXIDATION IN THE EAF	19
--	-----------

Anže BAJŽELJ, Jaka BURJA

HANDLING OF FINE GRANULAR BULK MATERIAL: REDUCTION OF PARTICLE WALL FRICTION BY DIAMOND-LIKE CARBON COATING	25
--	-----------

Christof LANZERSTORFER

QUALITATIVE STUDY ON THE EFFECT OF SLAG COMPOSITION ON THE PYROMETALLURGICAL RECYCLING OF LITHIUM-ION BATTERY BLACK MASS	30
---	-----------

Safoura BABANEJAD, Hesham AHMED, Charlotte ANDERSSON

RISK ASSESSMENT OF CASTING POWDERS ENTRAPMENT IN A 26 TONNE STEEL INGOT USING NUMERICAL SIMULATION.....	37
--	-----------

Anna MANTELLI, Cristian VISCARDI, Roberto ROBERTI, Annalisa POLA, Marcello GELFI, Massimo SVANERA, Fábio FERREIRA

THE SELECTED DESIGN AND OPERATING PARAMETERS OF BRIQUETTING PRESSES AND LINES FOR THE TREATMENT OF SCRAP METAL AS CHARGE TO STEEL FURNACES	44
---	-----------

Ladislav KOVÁŘ, Štěpán PRAVDA, Eliška NOVÁKOVÁ, Daniel KURAČ

KINETIC AND THERMODYNAMIC ASPECTS IN MATHEMATICAL MODELING OF HOT METAL DESULFURIZATION PROCESS	50
--	-----------

Angelika PODOLSKA-LOSKA, Jan FALKUS

HEAT TRANSFER IN THE PRIMARY COOLING ZONE OF A CONTINUOUS CASTING MACHINE FOR STEEL	56
--	-----------

David RIGO, Marek VELIČKA, Mario MACHŮ

THERMAL PROPERTIES OF SHAFT FURNACES FOR EXPERIMENTAL ARCHAEOLOGICAL METALLURGY	62
--	-----------

Jan RŮŽIČKA, Marek VELIČKA, Mario MACHŮ, Jana RŮŽIČKA, David RIGO

ASSESSMENT OF THE INTERNAL QUALITY OF ZINC CASTINGS DURING MOULD LIFE USING COMPUTED TOMOGRAPHY.....	68
---	-----------

Kamil KOZA, Karel GRÝC, Ladislav SOCHA, Roman KUBEŠ, Václav SOCHACKÝ, Jaromír TROBL, Jana SVIŽELOVÁ, Martin PINTA

SESSION B - METAL FORMING

DEVELOPMENT OF A TEST SETUP FOR THE EXPERIMENTAL DETERMINATION OF THE HEAT TRANSFER COEFFICIENT FOR COMPOUND FORGING	75
---	-----------

Bernd-Arno BEHRENS, Johanna UHE, Hendrik WESTER, Norman MOHNFELD

COLD ROLLING - COOLING ENHANCEMENT AND OPTIMIZATION	81
--	-----------

Milan HNIZDIL, Martin CHABICOVSKY, Ondrej RESL

SELECTED ASPECTS OF MULTI-STAGE HOT FORGING OF 80MnSi8-6 STEEL.....	87
Marek WOJTASZEK, Grzegorz KORPAŁA, Magdalena Barbara JABŁOŃSKA, Łukasz LISIECKI, Krystian ZYGUŁA, Kamil CICHOCKI, Wiktoria SKONIECZNA, Michał PUŁAWSKI, Ulrich PRAHL	
EXAMINING THE EFFECT OF ANGULAR POSITIONING ERRORS ON WELD QUALITY IN MANUAL LASER SPOT WELDING	93
Bariş KOYAŞ, Emre ŞERİFAĞAOĞLU, Murat REIS	
EFFECT OF FORGING TEMPERATURE ON THE FINAL PROPERTIES AND GRAIN STRUCTURE OF ARTIFICIALLY AGED EN AW 6056 ALUMINUM ALLOY	99
Mehmet Okan GÖRTAN, Gizem AY, Fatih ÇAĞIRANKAYA	
A PRELIMINARY STUDY ON DEVELOPING A MATERIAL MODEL BASED ON A MIXTURE OF CLAY AND CERAMIC FLOUR INTENDED FOR THE EXTRUSION OF BANDS FOR CERAMIC ROOF TILES TO ESTABLISH A NUMERICAL MODEL FOR THE LOAD ON FORMING TOOLS	105
Marek HAWRYLUK, Jan MARZEC, Łukasz MADEJ, Konrad PERZYŃSKI, Łukasz DUDKIEWICZ	
PREFORM DESIGN AT AXISYMMETRIC HOT CLOSED-DIE FORGING USING SIMPLE MOVING AVERAGE SMOOTHING TECHNIQUE	112
Rossen RADEV, Danail GOSPODINOV, Mariana ILIEVA, Nikolay FERDINANDOV	
SESSION C - STEELS, PROPERTIES, STEEL PRODUCTS, TESTING	
INFLUENCE OF C CONTENT AND ANNEALING TEMPERATURE ON MICROSTRUCTURE AND MECHANICAL PROPERTIES OF DOUBLE ANNEALED MEDIUM MN STEELS	119
Artem ARLAZAROV, Frederic KEGEL, Nicolas KENNEL	
ANALYSIS OF THE MICROSTRUCTURE AND ENERGY ABSORPTION CAPACITY OF HIGH-MANGANESE TWIP STEEL DEFORMED UNDER STATIC AND DYNAMIC LOADING CONDITIONS	125
Michał KOSTKA, Katarzyna JASIAK, Mikołaj KONOFOL, Mateusz WESOŁOWSKI, Iwona BEDNARCZYK, Marek TKOCZ, Zbigniew GRONOSTAJSKI, Magdalena B. JABŁOŃSKA	
THE EFFECT OF ANNEALING TEMPERATURE, INTERCRITICAL PAUSE AND INITIAL MICROSTRUCTURE OF LOW CARBON STEEL ON DP MICROSTRUCTURE FORMATION	131
Tomasz KAŻMIERSKI, Janusz KRAWCZYK, Łukasz FROCISZ	
EFFECT OF MARTENSITE DISTRIBUTION ON STRAIN DISTRIBUTION AND UNIFORM ELONGATION IN DUAL-PHASE STEELS; COMPARISON BETWEEN A SEGREGATION NEUTRALISED GRADE AND A COMMERCIAL GRADE.....	137
Pedram DASTUR, Carl SLATER, Claire DAVIS	
ASSESSMENT OF BRITTLE FRACTURE PROPERTIES BY SMALL PUNCH TEST	143
Jan KANDER, Ondřej DORAZIL, Miroslav FILIP, Petr ČÍŽEK, Petr JONŠTA	
STRAIN AND STRAIN AGING CHARACTERISTICS OF LOW-CARBON MICROALLOYED HEAVY PLATE STEEL GRADE S460MLO WITH PRE-QUALIFICATION FOR ARCTIC AREAS.....	149
Andrei FILATOV, Eugene GOLI-OGLU	
THE ANALYSIS OF CHOSEN PARAMETERS OF THERMOMECHANICAL ROLLING OF HSLA STEELS.....	155
Tomasz HAMRYSZCZAK, Mathias ZAPF, Tomasz ŚLEBODA, Grzegorz KORPAŁA, Ulrich PRAHL	

ANALYSIS OF PRECIPITATION AND DISSOLUTION PROCESSES IN THE CONTEXT OF GRAIN ORIENTED HIGH SILICON STEEL PRODUCTION	160
Kamila ŚCIBISZ, Janusz KRAWCZYK, Rafał DZIURKA, Piotr MATUSIEWICZ	
AISI H13 TOOL STEEL - COMPARISON BETWEEN POWDER BED FUSED AND CLASSICALLY PRODUCED PARTS	166
Samo TOME, Irena PAULIN, Matjaž GODEC	
METHODOLOGY FOR NUMERICAL SIMULATION OF THE LOW CYCLE FATIGUE LIFE.....	172
Sushant Bhalchandra PATE, Gintautas DUNDULIS, Paulius GRISKEVICIUS	
CORROSION OF HOUSEHOLD MIXER HEADS	178
Jaka BURJA	
INFLUENCE OF WELDING FORCE ON DYNAMIC RESISTANCE IN SPOT WELDING.....	184
Tomáš BURKET, Marie KOLAŘÍKOVÁ, Vít JANOUC	
POSSIBILITIES OF ENSURING A STABLE AND OPTIMAL OPERATING TEMPERATURE OF FORGING TOOLS USING AN INDUCTION HEATING SYSTEM WITH THE POSSIBILITY OF TEMPERATURE CONTROL AND RECORDING	190
Łukasz DUDKIEWICZ, Marek HAWRYLUK, Sławek POLAK, Jan MARZEC, Roger TKOCZ	
ADDITIVE MANUFACTURING AND PROPERTIES OF THIN WALLS PRODUCED OF STAINLESS STEEL.....	197
Jakub KARMÁČEK, Miroslav SAHUL, Pavel ROHAN, Marie KOLAŘÍKOVÁ, Adam NOVOTNÝ, Vít NOVÁK, Tomáš NĚMEC	
CREEP CAVITATION BEHAVIOUR OF P91/P92 STEELS DURING LONG-TERM CREEP TESTS	203
Zdeněk KUBOŇ, Jana KOSŇOVSKÁ, Gabriela ROŽNOVSKÁ	
ANALYSIS OF SELECTED PROPERTIES OF STEEL USED FOR TOOLS FORMING A BAND ASSIGNED FOR THE PRODUCTION OF CERAMIC ROOFING TILES IN THE ASPECT OF METHODS OF PROLONGING THE PERFORMANCE LIFE.....	209
Jan MARZEC, Marek HAWRYLUK, Tadeusz LEŚNIEWSKI, Marzena LACHOWICZ, Anna KUŚ, Magdalena JABŁOŃSKA	
STRUCTURAL AND FATIGUE ANALYSIS OF CARDAN SHAFT	215
Burak AL, Murat ÖZSOY, Neslihan ÖZSOY	
LABORATORY EXPOSURE LOOP FOR SIMULATION OF FOSSIL FUEL POWER PLANT SUPERHEATER OPERATION CONDITIONS	221
Lucie PILSOVÁ, Marie OHANKOVÁ, Vladimír MÁRA, Irena ANDRŠOVÁ	
MECHANICAL PROPERTIES OF SUBMERGED ARC WELDMENTS OF HIGH STRENGTH STEEL S960QL	227
Danail GOSPODINOV, Nikolay FERDINANDOV, Mariana ILIEVA, Rossen RADEV	
SESSION D - SURFACE ENGINEERING	
INFLUENCE OF DEFORMATION ON THE INTERFACE PROPERTIES OF COATED FUSELAGE SHELLS.....	234
Jan JEPKENS, Norman MOHNFELD, Philipp MÜLLER, Hendrik WESTER, Sven HÜBNER, Simon WEHRMANN, Bernd-Arno BEHRENS	
IDENTIFICATION OF DEFECTS ON NIDI COATING	240
Katerina KREISLOVA, Anna PISKOVA	

PLASMA-ELECTROLYTE POLISHING OF LOW-ALLOY STEEL 16MnCrS5.....	246
Marcela POKUSOVÁ, Ivan MORÁVEK, Zuzana GABRIŠOVÁ, Ján LACH, Norbert KOVÁČIK, Alena PRIBULOVÁ	
MONITORING THE CORROSION BEHAVIOR OF THE OPERATED AND NON-OPERATED MATERIAL OF THE MAIN CIRCULATION PIPE VVER 440 TYPE REACTOR.....	252
Matúš GAVALEC, Mária DOMÁNKOVÁ, Marek KUDLÁČ, Katarína BARTOVÁ, David SLNEK	
EVALUATION OF FRACTURE TOUGHNESS OF BORIDE LAYERS ON HIGH CHROMIUM STEELS	258
Peter ORIHEL, Peter JURČI, Matej PAŠÁK	
PRODUCTION AND CHARACTERIZATION OF SILISIDE COATING ON MIRRAX ESR ALLOY BY PACK CEMENTATION METHOD.....	264
Tuba YENER, Göknil GÜRPINAR NALBUROGLU, S. Cagri YENER	
COMPARATIVE ANALYSIS OF Cu-Nb MICROCOMPOSITE CONDUCTOR WELDING TECHNIQUES	269
Paulius BEINORAS, Gediminas MIKALAIUSKAS, Nikolaj VISHNIAKOV, Oleksandr KAPUSTYNSKYI	
CHARACTERISATION OF OXIDE SCALE LAYERS ON IRON-BASED STEELS ON THE NANOSCALE FOR HOT FORGING	275
Bernd-Arno BEHRENS, Johanna UHE, Thomas LAMPKE, Tim BERGELT, Marcel GRAF, Hendrik WESTER, Simon PEDDINGHAUS, Norman MOHNFELD	
EFFECT OF FINAL MACHINING ON CORROSION PROPERTIES AND STRESS CORROSION CRACKING SUSCEPTIBILITY OF AUSTENITIC STAINLESS STEEL.....	281
Marek KUDLÁČ, Mária DOMÁNKOVÁ, Katarína BARTOVÁ, Matúš GAVALEC, Dávid SLNEK	
EFFECT OF OVERLAP RATIO ON POROSITY AND MICROHARDNESS OF 42C MARTENSITIC STAINLESS STEEL ON FGS600-3A DUCTILE CAST IRON IN LASER CLADDING TECHNOLOGY	287
Meryem ALTAY, Hakan AYDIN, Ahmet ONAYLI, Adem KARŞI	
STRUCTURE AND PROPERTIES OF Cu/CARBON PHASE COMPOSITE COATINGS PRODUCED BY ELECTROCHEMICAL REDUCTION METHOD	293
Grzegorz CIEŚLAK, Marta GOSTOMSKA, Katarzyna SKROBAN, Adrian DĄBROWSKI, Tinatin CICISZWILI-WYSPIAŃSKA, Anna MAZUREK, Edyta WOJDA, Michał GŁOWACKI, Anna GAJEWSKA-MIDZIAŁEK	
MICROSTRUCTURE, MICROHARDNESS AND FRACTURE TOUGHNESS OF BOROCROMIZED LAYERS MODIFIED WITH LASER BEAM	299
Aneta BARTKOWSKA, Dariusz BARTKOWSKI	
DEVELOPMENT OF A METHODOLOGY FOR SCRATCH TESTING COLD SPRAY COATINGS.....	305
Marek DOUBRAVA, Lukáš ŘEHOŘEK, Libor PANTĚLEJEV	
ANALYSIS OF THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF OXIDE COATINGS PRODUCED BY RF- MS AND HIPIMS.....	311
Joanna KACPRZYŃSKA-GOŁACKA, Rafał BRUDNIAS, Daniel PAĆKO, Andrzej KRASIŃSKI	
STUDY OF THE BEHAVIOUR OF INNOVATIVE MATERIALS IN LIQUID METAL ENVIRONMENT	317
Martina PAZDEROVÁ, Lucia ROZUMOVÁ	

INFLUENCE OF PROCESS PARAMETERS OF THE ION SOURCE ON THE HYDROPHILIC PROPERTIES OF POLYMERIC MATERIALS	323
Artur PIASEK, Joanna KACPRZYŃSKA-GOŁACKA, Sylwia SOWA, Edyta OSUCH-SŁOMKA, Monika ŁOŻYŃSKA, Anita SNOPCZYŃSKA, Andrzej KRASIŃSKI, Jerzy SMOLIK	
THE EFFECT OF MICRO-MACHINING WITH A SINGLE-MODE AND MULTI-MODE FIBER LASER ON THE SURFACE OF DLC COATINGS.....	328
Artur KALINOWSKI, Norbert RADEK, Krystian MULCZYK, Jacek PIETRASZEK	
RESISTANCE OF Al-BASED COATING IN LIQUID METAL ENVIRONMENT OF 625 STEEL.....	334
Lucia ROZUMOVÁ, Martina PAZDEROVÁ, Lukáš KOŠEK	
THE SUPERFICIAL LAYER OF PARTS ALLOYED BY ELECTRO-DISCHARGE METHODS	340
Sławomir SPADŁO, Krzysztof ŁAKOMIEC, Joanna DUŚ-SPADŁO, Dominik DUDEK, Daniel SZYPUŁA, Marcin OŻÓG, Katarzyna ZIELIŃSKA, Krzysztof ŁUCZAK	
THE IMPORTANCE OF CURRENT MODE ON THE PROPERTIES OF PEO COATINGS DEPOSITED ON THE SURFACE OF POWDER METALLURGY-PRODUCED Mg SUBSTRATE	346
Martin BUCHTÍK, Pavlína ŠOMANOVÁ, Eliška KOBZINKOVÁ, Matěj BŘEZINA, Leoš DOSKOČIL	
CHARACTERISTICS OF Zn COATING CREATED BY HOT-DIP GALVANIZING ON A WELDED JOINT OF STRUCTURAL STEEL KOSMALT E300T WELDED USING MAG TECHNOLOGY.....	352
Jiřina VONTOROVÁ, Jitka PODJUKLOVÁ, Kateřina KREISLOVÁ, Jan VANĚK, Klára KURSOVÁ, Petr MOHYLA	
CORROSION PERFORMANCE AND MECHANICAL STRENGTH OF CONVENTIONAL PRESTRESSING STEEL REINFORCEMENT WITH BORIDE LAYER.....	359
Petr POKORNÝ, Vlastimil BROŽEK, Libor MASTNÝ, Veronika STEINEROVÁ, Nikola PRODANOVIC	
SESSION E - NON-FERROUS METALS AND ALLOYS	
TiBAI OUTPERFORMS TiCAI IN GRAIN REFINEMENT EFFICIENCY OF ENHANCED EN AW-3003 ALUMINIUM ALLOY PREPARED BY TWIN-ROLL CASTING	366
Lukas PAVLASEK, Martin BERNATIK, Ondrej STEJSKAL	
THE EFFECT OF ANODIZING TIME ON THE TRIBOLOGICAL PROPERTIES OF 6061-T6 ALUMINUM ALLOY	373
Fatih BOZKURT	
INFLUENCE OF CHEMICAL COMPOSITION ON THE HOT TEARING SUSCEPTIBILITY OF WROUGHT 6005 ALUMINIUM ALLOYS	380
Emidio GIANANTE, Giulio TIMELLI, Alberto FABRIZI	
WELD EVALUATION OF EUTECTIC HIGH-ENTROPY ALLOY AND AUSTENITIC STEEL FORMED BY EBW	387
Ján RONČÁK, Patrik JOZEFOVIČ, Martin ZOBAČ	
SOME ASPECTS OF ELASTIC AND PLASTIC DEFORMATION OF Cu-Ag METASTABLE METAL-MATRIX COMPOSITES.....	394
Pavel LEJČEK, Angelina STRAKOSOVA, Filip PRŮŠA, Drahomír DVORSKÝ, Martin KOLLER, Hanuš SEINER	
CHARACTERIZATION OF THE PROPERTIES AND ACICULAR MICROSTRUCTURE OF A LEAD-FREE COPPER ALLOY	400
Agnieszka CHACZYK, Philipp SKODA, Janusz KRAWCZYK	

BIOCOMPATIBLE TiNbTaSn-BASED ALLOYS OBTAINED BY RECYCLING	406
Jiří REŽNAR, Daniel PETLÁK, Martin HALFAR, Jaromír DRÁPALA, Jan KRČIL, Vladimír MÁRA, Eliška GALČÍKOVÁ	
VAT PHOTOPOLYMERIZATION ASSISTED ADDITIVE MANUFACTURING OF TITANIUM SCAFFOLDS	414
Lenka DROTÁROVÁ, Sebastian GASCON PEREZ, Carolina OLIVER-URRUTIA, Serhii TKACHENKO, Karel SLÁMEČKA, Ladislav ČELKO, Edgar B. MONTUFAR	
THERMAL STABILITY OF TI NANOPARTICLES COATED BY Ni	420
Miroslav CIESLAR, Lucia BAJTOŠOVÁ, Nikoleta ŠTAFENOVÁ, Elena CHOCHOLÁKOVÁ, Jan HANUŠ, Jan FIKAR	
INVESTIGATION OF PHASE COMPOSITION, MICROSTRUCTURE AND THERMAL BEHAVIOR OF Sn-3.0Ag-0.5Cu SOLDER ALLOYS WITH Ni ADDITION	426
Tereza MACHAJDÍKOVÁ, Roman ČIČKA, Ivona ČERNÍČKOVÁ, Libor ĎURIŠKA, Marián DRIENOVSKÝ	
THE Zn INFLUENCE ON DEGRADATION BEHAVIOUR OF Sn-BASED MATERIALS	432
Alena MICHALCOVÁ, Dominika FINK, Šárka MSALLAMOVÁ, Jáchym PALEČEK, Martin FRIÁK	
MnO ACTIVITIES DETERMINATION FOR BASIC MANGANESE ORES IN THE COKE BED ZONE	438
Michel Kalenga WA KALENGA, Didier Kasongo NYEMBWE	
INVESTIGATING THE EFFECT OF (Nh₄)₂SnCl₆ ON THE TIN PEST PROCESS	444
Dominika FINK, Alena MICHALCOVÁ, Šárka MSALLAMOVÁ	
CONTRIBUTION TO SURFACE TEXTURE CHARACTERIZATION OF 3D PRINTED PARTS	450
Hoangtung NGUYEN, David DOBROCKY, Jiri PROCHAZKA	
A NOVEL METHOD FOR MANUFACTURING OF HYBRID STRUCTURES MADE OF METALANDFIBER REINFORCED PLASTICS USING A MULTIDIRECTIONAL FORMING PROCESS.....	456
Johannes HOLT, Michael GOPFAUF, Hendrik WESTER, Johanna UHE, Bernd-Arno BEHRENS	
INFLUENCE OF WATER ABSORPTION ON TENSILE AND FLEXURAL PROPERTIES OF COMPOSITE SAMPLES	461
Jindřich VILIŠ, David KUSMIČ, Bui Thanh PHAN, Jan ZOUHAR, Zdeněk POKORNÝ, Pavel ŠAFL, Ondřej LINKA	
DEPOSITION OF PROTECTIVE THIN LAYERS ON STRIATED REBCO SUPERCONDUCTING TAPES	467
Simona HULAČOVÁ, Marcela PEKARČÍKOVÁ, Michal SKARBA, Eva CUNINKOVÁ, Lubomír FROLEK, Filip FERENČÍK, Marián KUBLIHA	
ENERGY AND ENVIRONMENTAL ASSESSMENT OF PROCESSING THE SECONDARY RAW MATERIALS IN HYDROMETALLURGICAL ZINC PRODUCTION	473
Georgi PATRONOV	
APPLICATION OF ETHALINE DEEP EUTECTIC SOLVENT FOR DISSOLUTION OF GOLD IN SULFIDIC REFRACTORY ORE UNDER VARYING pH.....	479
Jeanette Karen A. FAIGAL, Christopher Welbourne B. FERRER, Lorenzo Jon M. VILLALOBOS, Zyrh Gwen I. SUAYBAGUIO, May Anne E. MATA, Gernelyn T. LOGROSA	
GOLD METAL DISSOLUTION FROM REFRACTORY ORE THROUGH CALCIUM HYPOCHLORITE AND SODIUM CHLORIDE LEACHING PROCESS	491
Harvin Lee B. MAGHUYOP, Janna Crissile A. ARCAMO, Josch Gabryle E. DENILA, Rica Jan C. ONDOY, Zyrh Gwen I. SUAYBAGUIO, May Anne E. MATA, GernelynT. LOGROSA	

INFLUENCE OF ORGANIC ADDITIVES ON THE EFFICIENCY OF ELECTROFLOTATION EXTRACTION OF A MIXTURE OF METALS	500
HEIN THU AUNG	
Ti NANOPARTICLES: DISLOCATION IDENTIFICATION AND STRUCTURAL ANALYSIS	504
Lucia BAJTOŠOVÁ, Nikoleta ŠTAFENOVÁ, Elena CHOCHOĽAKOVÁ, Jan HANUŠ, Jan FIKAR, Miroslav CIESLAR	
TESTING OF CORROSION BEHAVIOR OF INCONEL 738 AT HIGH TEMPERATURES IN CARBON DIOXIDE	510
Tereza BARTÍKOVÁ, Adam PŘIBYL	
TIG WELDED AA6061 ALLOY UTILIZING COMPOSITE FILLER METAL CONTAINING TiO₂: MICROSTRUCTURE AND MECHANICAL PROPERTIES.....	516
Esmaeil EDRISI ARANI, Mehdi MANSOURI HASAN ABADI	
POSSIBILITIES OF RECYCLING Ti-6Al-4V AND ITS USE IN ADDITIVE MANUFACTURING.....	523
Eliška GALČÍKOVÁ, Jan KRČIL, Vladimír MÁRA, Lucie PILSOVÁ, Jiří REŽNAR, Jaromír DRÁPALA	
THE EFFECT OF HOT ISOSTATIC PRESSING ON STRUCTURAL AND MECHANICAL PROPERTIES OF METAL-BONDED DIAMOND GRINDING MATERIALS WITH HIGH POROSITY	529
Jan JUŘICA, Kateřina SKOTNICOVÁ, Tomáš ČEGAN, Filip JANHUBA, Eduard MATÚS, Jana RŮŽIČKA	
MORPHOLOGY OF Ni-Ti CORE-SHELL NANOPARTICLES	536
Rostislav KRÁLÍK, Elena CHOCHOĽAKOVÁ, Lucia BAJTOŠOVÁ, Nikoleta ŠTAFENOVÁ, Barbora KIHOULOU, Jan HANUS, Miroslav CIESLAR	
LEAD-BASED WASTES FROM METALWORKING PROCESSES - THE POSSIBILITY OF USING	542
Jitka MALCHARCZIKOVÁ, Simona TURKOVÁ	
PREPARATION AND BASIC CHARACTERISTICS OF NICKEL MATRIX COMPOSITE.....	548
Adam NOVOTNÝ, Pavel ROHAN, Jakub KARMÁČEK, Miroslav SAHUL, Marie KOLAŘÍKOVÁ	
PYROMETALLURGICAL RECOVERY OF VALUABLE METALS FROM Zn-Pb SLAGS.....	554
Katarzyna NOWIŃSKA, Zdzisław ADAMCZYK	
DETERMINATION OF PARAMETER EFFECTS IN THE DRILLING PROCESS OF ALUMINIUM 5083-H111 MATERIAL BY RESPONSE SURFACE METHOD	562
Emre TEKE, Neslihan ÖZSOY, Murat ÖZSOY	
SURFACE DEGRADATION OF TUNGSTEN FOR PLASMA-FACING COMPONENTS AFTER THERMAL LOADING	568
Roman PETRÁŠ, Mark MURTAZIN, Matěj PETERKA, Jiří MATĚJÍČEK, Michal HAJÍČEK, Petr HAVLÍK, Ondřej ČÍŽEK, Jiří ZÝKA, Ladislav VÁLA	
PREPARATION OF COMPOSITES BASED ON FeSi-NiAl BY VACUUM INDUCTION MELTING	575
Ivo SZURMAN, Kateřina SKOTNICOVÁ, Václav KALOČ, Tomáš ČEGAN, Jan JUŘICA, Pavel NOVÁK	
LOW TEMPERATURE INVESTIGATIONS OF PHASE TRANSFORMATION IN PURE TIN.....	581
Pavla ROUPCOVÁ, Eva ŠVÁBENSKÁ, Oldřich SCHNEEWEISS, Lubomír HAVLÍČEK, Alena MICHALCOVÁ, Šárka MSALLAMOVÁ, Martin FRIÁK	
AlSi7Mg ALLOY CAR RIMS MANUFACTURING TECHNOLOGY	587
Jarosław PIĄTKOWSKI, Leszek CHOWANIEC	

SESSION F - ECONOMICS AND PRODUCTION MANAGEMENT IN THE METALLURGICAL, STEEL AND RELATED INDUSTRIES

DIGITALIZATION OF INTRA-COMPANY ROAD FREIGHT TRANSPORT	594
KRYŠTOF WALICA	
REAL-TIME AUTOMATIC PROCESS AND METALLURGY CONTROL FOR FLAT C-STEEL PRODUCTION	598
Arnaud OLLAGNIER, Etienne MENIGAULT, David BARBIER	
ARTIFICIAL NEURAL NETWORK USED IN THE MATERIAL AND MASS BALANCE IN THE REDUCTION ZONE DURING HCFMN II	603
Michel Kalenga WA KALENGA, Didier Kasongo NYEMBWE	
AN IoT-BASED ELECTRIC CURRENT ASSISTED SINTERING SYSTEM CONTROL	609
Suayb Cagri YENER, Resat MUTLU	
DEVELOPMENT OF THE "IMPLEMENTATION DOCTORATE" PROGRAM IN POLAND IN THE FIELD OF ENGINEERING AND TECHNICAL SCIENCES ON THE EXAMPLE OF TOPICS RELATED TO METALLIC MATERIALS	615
Janusz KRAWCZYK, Jolanta KRÓLCZYK, Andrzej KURKIEWICZ, Michał WIECZOROWSKI	
IMPACT OF ADDITIVE MANUFACTURING IN MILITARY INDUSTRY	621
Martin VÍTEK, Jiří JELÍNEK, Roman VÍTEK	
ANALYSIS OF ALUMINUM CAN BY ECO-COSTS AND LIFE CYCLE ASSESSMENTS (LCA)	627
Dominika SIWIEC, Andrzej PACANA, Renata DWORNICKA	
MODEL OF EFFECTIVE QUALITY MANAGEMENT FOR THE IMPROVEMENT OF CASTING PROCESSES	633
Karolina CZERWIŃSKA, Andrzej PACANA, Renata DWORNICKA	
DEVELOPMENT OF NEW REFINING SLAG BY PROCESSED INDUSTRIAL WASTE	639
Viktor SINELNIKOV, Mariusz BORECKI, Jerzy WITEK, Andrzej ŚLIWA, Grzegorz KRAWIEC, Sergey SEMIRYAGIN	
AN ANALYSIS OF THE FINANCIAL LIQUIDITY MANAGEMENT STRATEGY IN POLISH ALUMINUM PRESSURE FOUNDRIES DURING THE CRISIS	645
Grzegorz ZIMON, Ahmed Mohamed HABIB, Md Hasanur RAHMAN	