

# **International Conference on Mechanical Engineering and Modern Technologies (MEMT2019)**

IOP Conference Series: Materials Science and Engineering  
Volume 795

Tomsk, Russia  
28 October - 1 November 2019

ISBN: 978-1-7138-2671-2  
ISSN: 1757-8981

**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 3.0 International Licence.  
Licence details: <http://creativecommons.org/licenses/by/3.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact the Institute of Physics  
at the address below.

Institute of Physics  
Dirac House, Temple Back  
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481  
Fax: 44 1 17 920 0979

[techtracking@iop.org](mailto:techtracking@iop.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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

MULTICOMPONENT ANTIFRICTION COMPOSITE BASED ON EXTRUDABLE MATRIX "UHMWPE - HDPE-G-VTMS - PP" FOR ADDITIVE MANUFACTURING.....	1
<i>S V Panin, D G Buslovich, L A Kornienko, Yu V Dontsov</i>	
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF NI-AL INTERMETALLIC THIN COATINGS PRODUCED BY MAGNETRON SPUTTERING.....	7
<i>T S Ogneva, A A Ruktuev, D V Lazurenko, M Khomyakov, A Karmanova</i>	
SPH SIMULATION OF PLASTIC DEFORMATION IN HIGH VELOCITY IMPACT WELDING PROCESS OF 6061-T6 ALLOY PLATES.....	13
<i>Yu Yu Emurlaeva, N S Aleksandrova, I A Bataev</i>	
MAIN PROBLEMS OF MATHEMATICAL MODELING HIGH ENERGIES PLASMA TECHNOLOGIES.....	20
<i>V I Bogdanovich, M G Giorbelidze</i>	
MODELLING THE INTERACTION OF STATIONS IN THE PORT RAILWAY JUNCTIONS .....	28
<i>E Borodina, E Prokofieva, S Vakulenko, A Petrov</i>	
THE WEAR RESISTANCE ADDITIVE PRODUCTS DERIVED FROM EED COBALT POWDER.....	39
<i>E V Ageev, A Yu Altukhov, E V Ageeva</i>	
OBTAINING AND RESEARCH OF ADDITIVE PRODUCTS FROM ELECTROEROSIVE COBALT-CHROME POWDERS.....	45
<i>E V Ageev, A Yu Altukhov, E V Ageeva</i>	
SIZE DEPENDENCE OF THE DISLOCATION SEGMENT VIBRATION SPECTRUM FOR VARIOUS TYPES OF DISLOCATIONS .....	50
<i>I L Bataronov, V V Dezhin</i>	
RELATIONSHIP BETWEEN PHASE COMPOSITION AND WEAR RESISTANCE OF TITANIUM ALLOYS.....	55
<i>I V Ivanov, A Thoemmes, K I Emurlaev, E I Tkachenko, E A Rudenya</i>	
NEURAL SIMULATION OF BALL MILL GRINDING PROCESS .....	61
<i>A A Zakamaldin, A A Shilin</i>	
INFORMATION RESERVATION OF CYBER-PHYSICAL PRODUCTION OF THE INDUSTRY 4.0.....	67
<i>D A Zakoldaev, A V Gurjanov, A V Shukalov, I O Zharinov</i>	
ESTIMATION OF STRESS-DEFORMED STATE OF THE CUTTING INSERT OF A DISK MILL USING COMPUTER-AIDED ENGINEERING.....	71
<i>V G Shalamov, S D Smetanin, I S Boldyrev</i>	
ANALYSIS OF PRESSURE AND DYNAMIC TESTS OF THE BLOCKED WHEEL PAIR.....	79
<i>V V Shiler, A V Shiler, I I Galiev, G I Petrov</i>	
STUDIES OF CURRENT MODULATION IN THE DC VOLTAGE LINK OF THE FREQUENCY CONVERTER DURING ITS OPERATION WITH ASYNCHRONOUS LOAD .....	85
<i>O V Arsentiev, G O Arsentiev</i>	

MATHEMATICAL MODELING OF THE ELECTRIC DRIVE WITH UNIVERSAL POWER SEMICONDUCTOR CONVERTER.....	90
<i>M P Dunaev, L V Arshinskiy</i>	
ORGANIZATION OF QUALITY CONTROL OF MANUFACTURED PRODUCTS IN SMART FACTORIES OF THE INDUSTRY 4.0 .....	98
<i>D A Zakoldaev, A V Shukalov, I O Zharinov, O O Zharinov</i>	
METHOD OF CALCULATING OF SPIROID GEAR RESOURCE BY WEAR AT STEP LOADING MODE.....	103
<i>A V Zaitsev</i>	
THE DEVELOPMENT OF DIGITAL TECHNOLOGIES IN MINING MACHINERY TECHNICAL MAINTENANCE .....	109
<i>V I Klishin, B L Gerike, A A Mokushev</i>	
ELECTROMAGNETIC METHOD FOR DETERMINING THE INTERNAL RESISTANCE OF CONDUCTIVE MATERIALS .....	117
<i>F Y Kuznetsov</i>	
LOAD CAPACITY OF SPHERICAL ROLLER TRANSMISSION WITH DOUBLE-ROW PINION .....	122
<i>M E Lustenkov, E S Lustenkova</i>	
IDENTIFICATION OF MATHEMATICAL MODEL OF DRYING UNIT.....	128
<i>F P Perevoshchikov, N V Vuong, A K Shabo, A A Shilin</i>	
PLANETARY TORUS HELICAL TRANSMISSION.....	133
<i>A P Prudnikov</i>	
INFLUENCE OF WEAR-RESISTANT COATING ON THE RELIABILITY OF REPLACEABLE INSERTS IN CUTTING STEEL .....	139
<i>J Zhang, V N Kozlov, S Liu</i>	
DETERMINATION OF GEOMETRIC PARAMETER OF CYCLOIDAL TRANSMISSION FROM CONTACT STRENGTH CONDITION FOR DESIGN OF HEAVY LOADING MECHANISMS .....	145
<i>E A Efremkov, S K Efremenkova, I M Dyussebayev</i>	
POWER PARAMETERS AUTOMATED CALCULATION FOR TRANSMISSION WITH INTERMEDIATE ROLLING BODIES AND FREE CAGE .....	151
<i>E A Efremkov, E Bonnard</i>	
DEVELOPMENT OF ENERGY EFFICIENT MECHATRONIC MODULE FOR ALTERNATIVE ENERGY .....	157
<i>K G Shibinskiy, E A Efremkov, N E Galin</i>	
FACTORS INFLUENCING STRENGTH AND DIRECTION OF NATURAL VENTILATION PRESSURE IN GENERAL MINES TO CONTROL MINE AIRING .....	166
<i>G B Lyalkina, A V Nikolaev, N S Makarychev</i>	
DESIGNING AN INFORMATION SECURITY SYSTEM IN SMART FACTORIES OF THE INDUSTRY 4.0.....	171
<i>D A Zakoldaev, A V Shukalov, I O Zharinov, O O Zharinov</i>	

**Author Index**