

International Scientific-Technical Conference on Innovative Engineering Technologies, Equipment and Materials (ISTC-IETEM-2019)

IOP Conference Series: Materials Science and Engineering
Volume 915

Kazan, Russia
4-6 December 2019

ISBN: 978-1-7138-4758-8
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. (2022)

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

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

Preface	
Peer review declaration	
Commissioning of a laboratory setup for studying the effects of ultraviolet and ozone on multifractional, unsorted production and consumption wastes.....	1
<i>T M Abdullin, I R Gilmanshin</i>	
Design of a laboratory installation for studying the effects of ultraviolet radiation and ozonation on organic compositions, unsorted municipal and medical waste	5
<i>T M Abdullin, I R Gilmanshin</i>	
Alternative model of project management at the stages of R&D	11
<i>A V Antonov, A S Puryaev</i>	
Developing a boss for hybrid electric motors	16
<i>F F Bagdanurov, L N Shafigullin, F M Akhmetov</i>	
Development of a parametric model for calculating cutting forces for external cylindrical turning of steel 20CrMNTi.....	19
<i>I P Balabanov, O N Balabanova, V N Gilman</i>	
Hardening of the working bodies of agricultural machines by electric spark and vibratory arc processing.....	24
<i>A T Bayniyazova, M M Abzhaev, S N Sharifullin</i>	
Research of parameters of hydrostatic transmission with axial flow divider for cases of multi-drive vehicle maneuvering.....	27
<i>A M Belousov, D L Karelina, A V Boldyrev, S V Boldyrev</i>	
Simulation of heat flows in a combined process of plasma spraying and coat hardening	31
<i>A M Kadyrmetov, S N Sharifullin, E V Snyatkov, A A Plahotin, I A Mandrykin, V V Romanov</i>	
Increase in efficiency of high-viscosity fluid transportation on the facilities of FEC	36
<i>A N Dolgova, A V Akhmerov, A L Osipov, Yu V Snigireva, O G Dudarovskaya, E S Karataeva</i>	
Comparative efficiency of pipeline heat-insulating materials	40
<i>A N Dolgova, S A Yunak, A S Rudenko, A I Haibullina, E S Karataeva</i>	
Study of the influence of hydroabrasive surface cleaning on a laser cutting.....	44
<i>Az T Gabdrakhmanov, I H Israphilov, L N Shafigullin, T F Gabdrakhmanova</i>	
Research of properties of polymer compositions based on aluminosilicate microspheres	48
<i>Az T Gabdrakhmanov, AT Galiakbarov, I Y Karasev, T F Gabdrakhmanova</i>	
Application of individual educational trajectories and adaptive content in engineering education.....	52
<i>R D Galeev, I R Gilmanshin, N F Kashapov, S I Gilmanshina</i>	
Experience in the application of nitriding in a glow discharge to increase the efficiency of gear processing by the method of grinding	59
<i>V N Gilman, A I Fashutdinov, I P Balabanov</i>	

Methodological features of using elements of distance learning in the training of competent specialists	63
<i>I R Gilmanshin, S S Kosmodemyanskaya, A I Galeeva, K Saduakaskyzy</i>	
Pedagogical conditions for training science teachers for sustainable development of society	67
<i>S I Gilmanshina, R N Sagitova, I R Gilmanshin, A I Galeeva, I A Galeev</i>	
Digital educational environment: training future teachers to design additional education.....	72
<i>S I Gilmanshina, V A Minnakhmetova, I R Gilmanshin, A I Galeeva, G M Abyzbekova</i>	
The digitalization of training of bachelors - the future science teachers	76
<i>S I Gilmanshina, I R Gilmanshin, A I Galeeva, G M Abyzbekova</i>	
How the radius of the screw insert core influences the flow behavior of the polymer solution	81
<i>A I Kadyirov, J V Karaeva, V O Zdor, E M Khusnutdinova</i>	
Formation of by-products during water chlorination as a result of corrosion of elements of the mechanical system.....	85
<i>O R Karataev, V F Novikov, R I Sayakhov, E S Karataeva</i>	
Influence of various types of fertilizers and equipment on the physical and microbiological properties of soil	89
<i>N F Kashapov, M M Nafikov, A R Nigmatyanov, V V Medvedev, V A Chernov, M D Nigmatullin</i>	
Features of robotization of agricultural processes	94
<i>N F Kashapov, M M Nafikov, A R Nigmatyanov, R F Sayutdinov, R A Mingazov</i>	
Using digital agricultural production based on navigation and information systems	98
<i>N F Kashapov, M M Nafikov, M M Nafikov, A R Nigmatyanov, O I Makarova, V V Medvedev, V A Chernov, M D Nigmatullin</i>	
Modeling the processes of forming the organizational structure of management in integrated formations.....	101
<i>N F Kashapov, M M Nafikov, M X Gazetdinov, Sh M Gazetdinov, A R Nigmatyanov</i>	
Technological preparation of production for product quality management according to IATF 16949:16 requirements	106
<i>S V Kasyanov</i>	
The increasing of the electric vehicle maneuverability, excluding disconnecting of the survey from the contact network	111
<i>A A Khafizov, R S Akhmetshin, R I Valiev</i>	
Improving the quality of surfaces of products obtained by electroerosion treatment.....	114
<i>I I Khafizov, I G Nurullin</i>	
Application of robotic systems in production: new opportunities for development and risks.....	119
<i>I I Khafizov, I G Nurullin, N F Kashapov</i>	
Application of electric spark doping technology for strengthening the surface of the Part.....	123
<i>I I Khafizov, I G Nurullin</i>	
Engineering experiment as an underlying tool for training research engineers.....	128
<i>G R Khamidullina, I A Konakhina, N F Kashapov, I I Khafizov, E M Khusnutdinova</i>	

Estimation of precision parameters of milling machines.....	131
<i>R M Khusainov, E R Ziangirova, G K Davletshina</i>	
Comprehensive Test Procedure for Digital Instruments and Devices of Automated Versatile Systems.....	135
<i>E M Khusnutdinova, P P Pavlov, V P Fandeyev, R N Khizbulin, A N Khusnutdinov, I V Cherepen'kin</i>	
Designing the Fault-Detection and Troubleshooting Tests For the Troubleshooting Target Flowchart.....	139
<i>E M Khusnutdinova, O A Filina, A N Khusnutdinov, A V Yashagina, G V Osetinskiy, N K Andreev</i>	
Influence of nonlinear viscosity of waxy crude oils on the thermohydraulic characterization of their flow in helical channels: theory and experiment	144
<i>E M Khusnutdinova, I A Konakhina</i>	
Improving the performance of cylinder liners by creating thin-layer coatings in the interface	147
<i>A T Kulakov, E P Baryshnikova, S V Snarsky, A A Gafiatullin, F L Nazarov, A F Malachowski</i>	
Innovations in the management system of industrial enterprise to improve the efficiency of its activities	151
<i>I A Kuzmina, I I Khafizov</i>	
The use of mathematical models to improve the effective functioning of enterprises	154
<i>I A Kuzmina</i>	
Development of apparatuses based on kinetic calculation data of the process of removing liquid from solid materials by reducing pressure of vapor-gas medium.....	157
<i>V A Lashkov, S G Kondrasheva, D A Khamidullina, E S Karataeva</i>	
Quality management when operating the power equipment.....	165
<i>A O Mamonova, E M Khusnutdinova, A N Khusnutdinov</i>	
The current quality management system at Magnitogorsk iron and steel works	168
<i>M N Moliboga, E M Khusnutdinova</i>	
Development of cast dispersion-hardening ferrite-carbide steel.....	171
<i>G F Mukhametzyanova, M S Kolesnikov, V I Astashchenko, I R Mukha-metzyanov</i>	
Development of hardening technology for working surfaces of microsurgical instruments made of titanium alloy.....	175
<i>F I Murataev, E R Galimov</i>	
To the question of automation of the injection molding process.....	186
<i>D L Pankratov, R V Gavariev</i>	
About computer calculation error of vermicular graphite share in microstructure of CGI.....	189
<i>A G Panov, I F Shaekhova, S A Ryzhkova, N G Degtyaryova, V A Ivanova</i>	
Evaluation of the wear resistance and resource hardened by electrospark machining of the cutting surfaces of the fingers of the headers of combine harvesters	192
<i>S A Velichko, S N Sharifullin, I S Kuznetsov, A V Kolomeichenko, R Y Solovyev, I N Kravchenko, N R Adigamov</i>	
Energy saving in mechanical engineering through energy management.....	196
<i>O A Plugatyreva, E M Khusnutdinova, A N Khusnutdinov</i>	

Methods of Optimizing the Troubleshooting Parameters of Electric Power Facilities.....	199
<i>L S Sabitov, P P Pavlov, V P Fandeyev, V M Butakov, A N Khusnutdinov, A S Siyetinskaya</i>	
Reliability study for traction electrical equipment of urban electric transport	203
<i>L S Sabitov, A E Aukhadeyev, R G Idiyatullin, R S Litvinenko, L N Kisneeva, A N Khusnutdinov, O V Ilyushin</i>	
Medical and Biological Problems in the Control of Therapeutic Exposure Parameters in Sports Medicine and Ways of Their Solution in New Medical Instruments and Systems.....	208
<i>L S Sabitov, Rob N Khizbullin, Rad N Khizbullin, P P Pavlov, A N Khusnutdinov, A R Abdullina</i>	
Digitalization of education: transformation of a natural science experiment	211
<i>R N Sagitova, S I Gilmanshina, I R Gilmanshin, A I Galeeva, G M Abyzbekova, K Saduakaskyzy</i>	
Recycling components made of polyurethane foam.....	215
<i>L N Shafigullin, N V Romanova, A T Gabrakhmanov, O P Korchagin, I R Shamsutdinov, D A Agashkin</i>	
Recommendations for making sound absorbing polyurethane materials	219
<i>L N Shafigullin, N V Romanova, S V Zonina, I E Valinova, I Yu Karasev</i>	
Rationality and possibility of automation of precision calibration of gears	223
<i>V G Shibakov, D L Pankratov, R S Nizamov, R A Hairullin</i>	
Frame model of knowledge representation in the expert system of technological route selection.....	231
<i>L A Simonova, G M Kapitonova</i>	
Physical basis of thermal control of the operating mode of the refrigeration unit.....	235
<i>I F Timerbaev, I R Gilmanshin</i>	
Industrial control system software patterns in manufacturing	241
<i>R A Valiev, Sh Sh Khuzyatov</i>	
Quantum chemical simulation for calculation of processes of sulfur composite materials	246
<i>A A Yusupova, A Y Akhmetova, L R Baraeva, R T Akhmetova, A I Khatsrinov, A A Bobyshev</i>	
High-technology energy-efficient composite material made from waste of thermal power plants	249
<i>A A Yusupova, G A Medvedeva, R O Akhmetova, A A Bobrishev</i>	
The laser heat-treatment process control by the non-stationary convective heat exchange modeling.....	253
<i>V V Zvezdin, R R Saubanov, R R Rakhimov, R M Khisamutdinov, A V Boldyrev, D L Kareljin</i>	

Author Index