

International Scientific and Technical Conference “Innovative Mechanical Engineering Technologies, Equipment and Materials-2014”

**IOP Conference Series: Materials Science and Engineering
Volume 86**

**Kazan, Russian Federation
3-5 December 2014**

**ISBN: 978-1-5108-0750-1
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.

Copyright© (2014) by the Institute of Physics
All rights reserved. The material featured in this book is subject to
IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2015)

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: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

Table of contents

Volume 86

**International Scientific and Technical Conference "Innovative Mechanical Engineering Technologies, Equipment and Materials-2014"
3–5 December 2014, Kazan Federal University, Kazan, Russian Federation**

Accepted papers received: 20 May 2015

Published online: 26 June 2015

Preface

011001

International Scientific and Technical Conference "Innovative Mechanical Engineering Technologies, Equipment and Materials-2014" - K Nail

011002

Peer review statement

Papers

012001

New approaches for evaluating rheological models in composites - A N Bobryshev, A V Lakhno, P V Voronov, E R Galimov, R F Sharafutdinov and N Ya Galimova....1

012002

High voltage high repetition rate pulse using Marx topology - A Hakki and N Kashapov....8

012003

Methodology development for the sustainability process assessment of sheet metal forming of complex-shaped products - D L Pankratov and L R Kashapova....13

012004

Technology of manufacturing of multiple core stamp tools by plastic deformation - D L Pankratov, V G Shibakov, A M Valiev and R F Valieva....18

012005

The appearance of shock waves in the plasma electrolytic processing - D G Denisov, N F Kashapov and R N Kashapov....22

012006

Optimization of burning process of hydrocarbon fuels with varying specific heat of combustion - E R Saifullin and Yu V Vankov....26

012007

Three-Beam Triangulating Sensor - E S Denisov, A Sh Salakhova, G V Timergalina, T P Nikishin and M G F Azlyyyakhmatov....29

012008

Acoustic energy generation by the burning fuel layer - E V Semenova....35

012009

Plasmachemical processing of raw liquid hydrocarbons by sunk microarc-discharge - G R Ganieva and B A Timerkaev....38

012010

Systematization of accuracy indices variance when modelling the forming external cylindrical turning process - I P Balabanov, L A Simonova and O N Balabanova....41

012011

Formation of initial data of the workpiece batch in simulation modelling precision forming - I P Balabanov, O N Balabanova and A V Groshev....48

012012

Cross-flow and heat transfer of porous permeable cylinder - I V Morenko, V L Fedyaev and E R Galimov....52

012013

Processing methods with imposing of electric field at low- waste division of materials - I I Khafizov....57

012014

Innovative technologies of waste recycling with production of high performance products - R Gilmanshin, A V Ferenets, Yu I Azimov, A I Galeeva and S I Gilmanshina....60

012015

Development of methodology for controlling the parameters of TP - K V Klochkova, S V Petrovich, L A Simonova and L R Yusupov....63

012016

Stages of vermicular cast iron properties modeling in the intelligent design system - K V Klochkova, S V Petrovich, L A Simonova and L R Yusupov....67

012017

Development of structural element precedent of technological process in computer-aided design - L A Simonova and E I Egorova....72

012018

Automated test system of internal combustion engines - L A Galiullin....78

012019

The research of anodic microdischarges in plasma-electrolyte processing - L N Kashapov, N F Kashapov and R N Kashapov....84

012020

Practical experience of using ultrasound flowmeters at the measurement associated petroleum gas - M G Fazlyyyakhmatov, N F Kashapov, Kh A Khayritonov, D K Lazarev and V K Lazarev....87

012021

Hardening of the surface plasma jet high-frequency induction discharge of low pressure - N F Kashapov and S N Sharifullin....93

012022

Triboplasma - the main component of plasma-chemical processes occurring in the friction units of machines and mechanisms in the presence of these drugs Tribo - N F Kashapov and S N Sharifullin....99

012023

The use of SHS-process slag for the preparation of foundry sand - N Safronov and L Kharisov....104

012024

Not adiabatic temperature of combustion gas-air mixture - O V Iovleva....108

012025

Equation of fluctuations frequency of gas in the devices such as capacity-tube - O V Iovleva and E V Semenova....111

012026

Polishing and deburring of machine parts in plasma of glow discharge between solid and liquid electrodes - R I Valiev, A A Khafizov, Yu I Shakirov and A N Sushchikova....114

012027

The choice of equipment for automation of hazardous production facilities - R R Ziyatdinov....119

012028

Algorithm and data support of traffic congestion forecasting in the controlled transport - S V Dmitriev....124

012029

Building axiological competence of graduate students by means of project-based learning - S I Gilmanshina and I R Gilmanshin....128

012030

Mathematical model of the flow of polymer melt in the extruder forming die - R F Sharafutdinov, E R Galimov and B A Snigerev....132

012031

Investigation of influence of the outlet channel length of extruder die hydrodynamics of extrusion process - R F Sharafutdinov, E R Galimov and B A Snigerev....135

012032

Prediction of samples failure during severe plastic deformation by multiple extrusion - V G Shibakov, D L Pankratov, A P Andreev and S I Andreeva....141

012033

Mathematical modeling and calculation of heating and melting of particles of the polymeric powder in flow channel of the sprayer - V L Fedyaev, I V Morenko, A R Siraev, E R Galimov, I R Gimranov, L R Fazlyev and M S Takhaviyev....146

012034

Enhancing performance of measurement of parametric sensors parameters - V Zamorskiy....151

012035

Determination of the oscillation frequencies of corrosion defects finite element methods in order to develop methods of acoustic monitoring of pipelines - Yu V Vankov, Sh G Ziganshin, E V Izmailova and V V Serov....156

012036

The effect of the size and position of transverse cracks in the natural frequencies of the rods - Yu V Vankov, Sh G Ziganshin, E V Izmailova and A R Zagretdinov....159

012037

Methods check the piping using a neural network - Yu V Vankov, Sh G Ziganshin, E V Izmailova and T O Politova....163

012038

Structural and phase transformations in cast irons when implanted into the surface layers of nitrogen ions - E R Akst....166