

## Actual Problems and Decisions in Machine Building

Selected, peer reviewed papers from the International Scientific and Practical Conference "Actual Problems in Machine Building", March 25th, 2015, Novosibirsk, Russian Federation

Bearbeitet von  
Vadim Yu. Skeeba

1. Auflage 2015. Taschenbuch. 344 S. Paperback

ISBN 978 3 03835 551 9

[Weitere Fachgebiete > Technik > Produktionstechnik](#)

schnell und portofrei erhältlich bei



Die Online-Fachbuchhandlung beck-shop.de ist spezialisiert auf Fachbücher, insbesondere Recht, Steuern und Wirtschaft. Im Sortiment finden Sie alle Medien (Bücher, Zeitschriften, CDs, eBooks, etc.) aller Verlage. Ergänzt wird das Programm durch Services wie Neuerscheinungsdienst oder Zusammenstellungen von Büchern zu Sonderpreisen. Der Shop führt mehr als 8 Millionen Produkte.

# Table of Contents

## Preface and Conference Organizers

## Chapter 1: Innovative Technologies of Materials Processing in Mechanical Engineering

<b>Acoustic and Emission Control of the Hereditable Stress and Strain State of the Metal Surface Layer during Cutting and Surface Plastic Deformation</b>	
V.Y. Blumenstein, F.I. Panteleenko, I.V. Miroshin and O.A. Ostanin	3
<b>Anode Dissolution Localization of Copper in Water Electrolytes</b>	
B.A. Krasilnikov and S.I. Vasilevskaya	11
<b>Contact Processes in Grinding</b>	
A. Yanyushkin, D. Lobanov, P. Arkhipov and V. Ivancivsky	17
<b>Efficiency of Steel Casting Production by Aluminothermic Metal Reduction</b>	
I.G. Sapchenko, S.G. Zhilin, O.N. Komarov, E.E. Abashkin and D.A. Potianikhin	22
<b>Features of Forming the Surface Microrelief of Low-Wear Coatings by Electro-Diamond Grinding</b>	
V.V. Yanpol'skiy and K.K. Rakhimyanov	28
<b>Forecasting of Machined Surface Waviness on the Basis of Self-Oscillations Analysis</b>	
E.B. Belov, S.L. Leonov and A.A. Sitnikov	35
<b>High-Precision Plasma Cutting of the Steel - Aluminum "Bimetallic Composition"</b>	
K. Rakhimyanov, A. Rakhimyanov and M. Heifetz	41
<b>Influence of Technological Parameters of High-Precision Plasma Cutting on the Position of the Anode Spot on the Cut Edge</b>	
A. Loktionov and N. Gaar	46
<b>Investigation of the Laser-Powder Cladding Effect on Steel Surface Hardening</b>	
V.V. Krasheninnikov, A.G. Malikov, A.M. Orishich and A.O. Tokarev	52
<b>Laser-Plasma Treatment of Structural Steel</b>	
A. Tokarev, Z. Bataeva, G. Grachev, A. Smirnov, M. Khomiakov and A. Gerber	58
<b>Modeling of Deformation Processes for Conditions of Ultrasonic Frequency Impulse Impact on the Surface Layer of Metals and Alloys</b>	
K. Rakhimyanov, K. Rakhimyanov and A. Eryomina	63
<b>Modeling of the Magnetic Abrasive Machining Process of Flat Surface Workpieces on Numerically Controlled Machine Tools</b>	
E. Tatarin, A. Ikonnikov, T. Schrayner and R. Grebenkov	69
<b>Nickel-Based Composition Coating with Titanium Nanoboride</b>	
K.A. Efimova, G.V. Galevskii, V.V. Rudneva, N.A. Kozyrev and E.G. Orshanskaya	75
<b>Plastic Imprint Formation in the Process of Ultrasonic Surface Hardening</b>	
J. Semyonova and A. Eryomina	82
<b>Quality Improvement of Wear-Resistant Coatings in Plasma Spraying Integrated with High-Energy Heating by High Frequency Currents</b>	
V. Skeeba, V. Pushnin and D. Kornev	88
<b>Selection of Synthesis Corundum Grain in Grinding Flat Parts from Hardened Steel 30ChGSA by the Macrogeometry Criterion</b>	
Y.I. Soler and L.V. Nguyen	95
<b>Some Provisions of Rational Contact Conditions for a Composite Cutting Tool during Turning Operations on Intermittent Areas</b>	
E.V. Pavlov and L.M. Chervyakov	102

## Chapter 2: Applied Materials Science in Machine Building

<b>An Impact of the Magnetic Field on the Fine Copper Structure under Creep Failure Conditions</b>	
S. Konovalov, N. Yaropolova, D. Zagulyaev, Y. Ivanov and V. Gromov	111

<b>Analysis of the Influence of High Temperature Synthesis Parameters on the Structure Formation in the Mechanically Activated 3Ti+Al Powder Mixture</b>	
M.V. Loginova, V.Y. Filimonov, V.I. Yakovlev, A.A. Sytnikov, A.Z. Negodyaev and D.V. Shreifer	117
<b>Cladding of Ni-Cr-Si-B Powder Coatings by an Electron Beam Injected into the Atmosphere</b>	
T. Zimoglyadova, E. Drobayaz, V. Bataev, E. Kornienko, D. Mul and I. Ivanchik	123
<b>Depth Distribution of Temperature in Steel Parts during Surface Hardening by High Frequency Currents</b>	
V. Ivancivsky, K. Parts and V. Popov	129
<b>Design of a Combined Setup for Simultaneous Measurements of the Microstructural and Thermo-Analytical Parameters of Nanogram-Size Samples</b>	
M. Rosenthal, A.P. Melnikov, A.A. Rychkov, D. Doblas, D.V. Anokhin, M. Burghammer and D.A. Ivanov	136
<b>Dry Sliding Wear Behavior and Wear Mechanisms of Thermally Sprayed WCCo-Coatings</b>	
A. Gontarenko, K. Möhwald, T.A. Deißer and H.J. Maier	143
<b>Effect of Plastic Deformation of the Initial Components and Particle Size Reduction on the Structure and Properties of the PN85YU15-Ni Composite Material Produced by Spark Plasma Sintering</b>	
L. Shevtsova, T. Sameyshcheva, D. Terentyev, I. Malyutina, A. Larichkin and V. Malikov	151
<b>Effect of Thermomechanical Treatment on the Properties of Steel with a Mixed Martensitic-Bainitic Structure</b>	
A. Popelyukh, M. Yurkevich and P. Popelyukh	157
<b>Effects of Heating Atmosphere on Structure and Thermal Expansion of Aluminum Alloys</b>	
V. Afanasyef, M. Popova and A. Prudnikov	163
<b>Energy Approach to Material Hardness Determination</b>	
P. Ogar, D. Gorokhov and I. Phedorov	170
<b>Formation of Intermetallic Structures by Spark Plasma Sintering of Titanium and Aluminum Powders</b>	
D.V. Lazurenko, V.I. Mali, N.S. Belousova and A. Theommes	177
<b>Fracture Mechanism of Thermomechanically Processed Low-Carbon Steel</b>	
N.D. Petrova and A.M. Ivanov	182
<b>Influence of Thermal Cyclic Deformation and Hardening Heat Treatment on the Structure and Properties of Steel 10</b>	
A. Prudnikov, M. Popova and V. Prudnikov	187
<b>Mechanical and Tribological Properties of <math>\gamma</math>-TiAl-Based Coatings Produced by the Laser Cladding Technology</b>	
I.N. Maliutina, H. Si-Mohand, R. Piolet, F. Missem and P. Bertrand	194
<b>Meyer Law Application for Solving Problems of Surface Plastic Deformation by Spherical Indentation</b>	
P. Ogar and D. Gorokhov	199
<b>Regularities of Changing Amorphous Metallic Alloys Properties under Exposure to External Influences</b>	
V. Fedorov, A. Yakovlev, T. Pluzhnikova, A. Berezner, D. Fedotov and M. Kombarov	205
<b>Shear-Type Mechanisms of Deformation Development in Structural Elements of a Deformation Relief</b>	
D.V. Lychagin and E.A. Alfyorova	211
<b>Simulation of Structure Formation Processes of Dissimilar Steels Welded Joints Using an Intermediate Layer</b>	
A. Nikulina, V. Skeeba, A. Chevakinskaya and P. Komarov	218
<b>Structure of the Al-Cr-Ni Coating Formed on the H20N80 Alloy Substrate and its Transformation at 1150 °C</b>	
V.G. Shmorgun, A.O. Taube and A.I. Bogdanov	225
<b>Structure, Properties and Texturing of Ti-Ta-Mo Alloys Produced by Non-Vacuum Electron Beam Surface Alloying of Ti</b>	
A.A. Ruktuev, I.A. Bataev, M.G. Golkovskii, A.A. Bataev, I.S. Laptev and A.M. Jorge	230
<b>Surface Alloying of Cylindrical Steel Parts Using Non-Vacuum Electron Beam Treatment</b>	
A. Losinskaya, D. Golovin, O. Lenivtseva and E. Lozhkina	237

<b>Surface Hardening of Steel by Electron-Beam Cladding of Ti+C and Ti+B<sub>4</sub>C Powder Compositions at Air Atmosphere</b>	241
D. Mul, D. Krivezhenko, T. Zimoglyadova, A. Popelyukh, D. Lazurenko and L. Shevtsova	
<b>Techniques of SrAl<sub>12</sub>O<sub>19</sub> Platelets Formation in ZTA</b>	246
N. Belousova, S. Veselov, N. Cherkasova, A. Lazarev, R. Kuzmin and M. Perepyolkin	
<b>The Effect of Heat Temperature on the Structure of Plasma Coating of the Ni-Cr-Si-B System</b>	252
E. Kornienko, A. Nikulina, E. Drobayaz, N. Plotnikova, E. Lapushkina and V. Kuz'min	
<b>The Influence of Pulsed Heat and Power Supply on the Structure and Properties of Welded Joint Metals and Surfaced Coatings</b>	259
Y.N. Saraev, V.P. Bezborodov and E.A. Putilova	
<b>The Structure and Corrosion Resistance of the Coatings Obtained by Non-Vacuum Electron Beam Cladding of the Ti-Nb Powder Mixture on a Titanium Substrates</b>	267
I.A. Polyakov, V.V. Samoylenko, O.G. Lenivtseva and M.G. Golkovski	
<b>Wear Resistance of Hypereutectoid Steel Alloyed with Copper and Aluminum</b>	274
N. Stepanova, E. Lozhkina, A. Razumakov and A. Losinskaya	
<b>Wear-Resistant Coating on Hard Alloy</b>	281
T.N. Oskolkova	
<b>X-Ray Studies of Welded Joints of Ferrite-Pearlite Steels Working in Conditions of Low-Frequency Temperature and Force Loading</b>	286
N.I. Golikov, A.A. Platonov and Y.N. Saraev	

### **Chapter 3: Technological Equipment, Machining Attachments and Instruments**

<b>Analysis and Technology of the Bricard Linkage Kinematic Parameters Comparative Experiments</b>	295
M.G. Yarullin, I.A. Galiullin and M.R. Mingazov	
<b>Equipment for <i>In Situ</i> Studies of the Surface Structure of Thin Surface Layers in the Process of their Formation</b>	301
V.A. Bataev, V.G. Burov, S. Grigorian, D.A. Ivanov, N.V. Plotnikova and A.I. Smirnov	
<b>Metal Explosion Chambers and their Application</b>	306
A. Shtertser, B. Zlobin and O. Stoyanovskii	
<b>Prospective Designs of Flap Grinding Wheels – New Opportunities and Approaches to Import Substitution of Grinding Tools</b>	313
A. Korotkov and D. Shatko	
<b>Specifications of Machine-Tool Equipment: Forecasting Techniques</b>	318
E. Zverev, P. Tregubchak, N. Vakhrushev and S. Ptitsyn	
<b>A Promising Method for Improving Wear Resistance of Metal Cutting Tools</b>	325
A.G. Ovcharenko, A.Y. Kozlyuk and M.O. Kurepin	