

Table of Contents

Preface

Chapter 1: Waste Treatment and Environmental Protection

Sustainable Development Goals: The Case of Industrial Ecology A. Heydarov	3
Sorbents Based on Iron Oxide Nanoparticles for Release of Tetracyclines for Water Treatment L. Vazirova and G. Abbasova	13
Modern Methods of Purification of Heavy Metal Ions from Wastewater M. Mirbabayev and G. Bahramova	21
Research of the Chemical Composition of Mining Industry Waste N. Shirinova and G. Kerimova	27
The Adsorption of Heavy Metal Ions F. Yusubov, M. Mirbabayev, G. Talibov, I. Aliyev and G. Valiyeva	33

Chapter 2: Additive Manufacturing

Fabrication of Multi-Layer 316L-TiC Composite by Selective Laser Melting Additive Manufacturing S. Yazdani, S. Tekeli and E. Akbarzadeh-CH	41
Investigation for Multi-Layer CuAl8 and Multi-Material (CuAl8-Mild Steel) Deposition via WAAM Process A. Shah, R. Aliyev, H. Zeidler and S. Krinke	47

Chapter 3: Machining and Tool Restoration

Formation of Geometric Parameters of the Surfaces of Cylindrical Parts during Waterjet Cutting S. Simon, N. Yusubov and S. Amirli	59
Punches and Matrices Recovery for Hot Punching by Electric Arc Hardfacing I.A. Savin, A.V. Shaparev, S.N. Ptichkin, I. Khankishiyev and A. Mirzayev	65
The Use Hot Stamping to Restore the Efficiency Tie Rod Ball Pins Trucks D.L. Pankratov, A.V. Shaparev, D.D. Pankratov, M. Garayev and Z. Azizli	73
Formation of Shaft Accuracy during Mechanical Processing on CNC Machines V. Abbasov, F. Amirov, S. Amirli, S. Hasanli and K. Frana	81
Development of Production Technology for the Valve of Steel Drilling Pump Brand of PK08X4H5 S. Namazov, T. Taghiyev and S. Mashayev	87

Chapter 4: Research and Design of Machines and Tools

Improving of Machining Efficiency of Threads and Conical Surfaces of Diverse Directions by Managing Static Technological Relationships N. Rasulov, U. Nadirov and I. Abbasova	97
Comparative Analysis of Dynamic Characteristics of Spherical and Eccentric Transmissions with a Double-Ring Satellite M. Lustenkov, I. Khalilov and A. Moiseenko	103
Influence of Technological Factors on the Performance and Aging Process of Oil Pumpjack A. Aliyev, S. Aliyeva and V. Fataliyev	111

Determination of the Ink Layer Thickness, Taking into Account the Surface Roughness of the Printing Forum E. Aliyev and S. Ismayilova	117
Research on Ratio Regulation Gear Differential Closed by a Continuously Variable Transmission (CVT) F. Mammadov and S. Baghirova	125
Anti-Vibration Foundation for the Machines Used in the Oil and Gas Industry V. Bakhshali	131
Verification of the Adequacy of the Created Work Cycle Calculation Model of Marine Diesel Engine A. Ismayilov and A. Aliyev	137

Chapter 5: Thermal Engineering

Increasing the Energy Efficiency of Heat Exchanger Devices R. Kalbaliyev, L. Akhmedova-Azizova and U. Nasibova	147
Analysis of the Speed of Sound in Solutions of Ionic Liquids with Methanol R. Kalbiyev, R. Hamidova and G. Abdullayeva	153

Chapter 6: Mechatronics

The Development and Study of an Electromechanical Converter for an Electro-Hydraulic Power Amplifier of a Servo-Hydraulic Drive S. Gandzha, N. Neustroev, A. Sogrin, D. Korobotov, D.V. Ardashev and R. Dadashov	163
Requirements Definition, Modeling, and Simulation of Control Units of an Electrohydraulic Power Amplifier D. Korobotov, A. Baturin, D.V. Ardashev and H. Abbasova	179
Research of the Electromagnetical Part of Three-Phase Electromagnetic Vibrator of Low Frequency Vibrations H. Guliyev, R. Huseynov and R. Yusifov	187
Issues Practical Implementation of the Receiving System Infrared Space Telescopes and Testing it at Low Temperatures V. Maherramov	197
Analysis of Operating Benefits of Modern Wind Turbines L. Hasanova, K. Aliyev and G. Sydykova	203
Intelligent Sensor Technology for Rotating Parts in Machines and Plants A. Bürger, S. Simon and S. HERNSCHIER	209
Classification of Subsea Construction Vessels and Evaluation of Study Effectiveness R. Bashirov and O. Abdullayev	217

Chapter 7: Power Engineering

Models of Power System Elements in Phase Coordinates for the Study of Non-Symmetrical Steady-State and Transition Modes F. Ibrahimov	227
Methodology for Assessing the Degree of Aging Overhead Power Transmission Lines of EES A. Muradaliyev	233
Increasing Control Automation and Management Flexibility in Distribution Electric Networks B. Sadiqlı, S. Aliyev, G. Guseynova and A. Mammadzade	241
Application of Volterra Integral Equations and Discrete Borel Transformations to Transient Switching Modes of Networks and Systems G. Hasanov and S. Aliyev	249

Chapter 8: Engineering Management

New Trends in Mechanical Engineering Technology H. Huseynov	257
Energy Efficiency as Driver of Sustainable Development G. Sydykova, M. Pashayeva, F. Mammadov and Z. Makhsud	265
Specifics of the Planning of Additive Manufacturing Processes R. Aliyev	273