

CONTENTS

PROSPECTS OF METALLURGY AND MATERIALS SCIENCE

| | |
|---|----|
| Theoretical aspects of the causes of the formation of a slag floor on the surface of the refresh Bohdan D.S., Malii Kh.V., Stoianov O.M. | 12 |
| Power consumption analysis of rutile-cellulose electrodes Boyko I.O., Pashinskiy V.V., Pashinska O.G. | 14 |
| Organization of energy-efficient blast furnace production with reduced environmental impact Boiko M.M., Petrenko V.O. | 17 |
| Unified blast furnace air tuyere Vereshchak V.I., Vereshchak D.V. | 20 |
| Improvement of technological conditions for rolling especially thin strips on the continuous plate mill 1680 Gribkov E.P., Pozhidayev A.V. | 24 |
| Physico-chemical characteristics of carbidothermal recovery of chromite and magnetite concentrates Hryshyn O.M., Nadtochii A.A., Petrenko V.O. | 26 |
| Improvement of the rolling technology of cold-rolled strips on the plate mill Tandem 1680 Dobronosov Yu.K., Los S.G. | 29 |
| Increasing the operational characteristics of equipment for the production of firebricks aluminum-silicate raw Diachenko A.S., Boyko I.O. | 31 |
| Refining metal in a tundish from non-metallic inclusions when blowing it with argon Yefimova V.G. | 34 |
| Evaluation of the efficiency of thermal work of metal receivers of blast furnaces of different designs Zhabrovets P.M., Chaika O.L., Kornilov B.V., Lebid V.V. | 37 |

| | |
|--|-----------|
| Study of the rolled stock separating into workpieces using breaking by bending with static-dynamic loading Karnaikh S.G., Markov O.Ye., Aliiev I.S. | 40 |
| Some aspects of the use of porous filters during aluminium casting Karpukhin Ye.O., Smirnov Yu.O., Smirnov O.M. | 43 |
| Increasing the service life of rolling stock wheelsets Kashuba Yu.A., Boyko I.O. | 46 |
| Comparative analysis of theoretical and experimental models in plastic deformation Kordenko M.Yu. | 50 |
| Study of existing and promising directions for reducing CO ₂ emissions based on the energy balance of blast furnaces Kornilov B.V., Chaika O.L., Moskalyna A.O. | 52 |
| Application of automated mineralogy in metallurgical research Kostrzyzhev A.H. | 55 |
| Prediction by residual stresses of the quality of thin rolled after temper rolling in warm deformation mode Kulik T.O., Kulik O.M. | 61 |
| Implementation of preventive quality management system for production of TMCP processed 10Mn2VNbAl steel heavy plates Kukhar V.V., Malii Kh.V., Wu Kaiming | 64 |
| Improvement of the emulsion cleaning system of the cold rolling mills of the cold rolling plant to remove hydraulic oils from the rolling emulsion Kukhar V.V., Spichak O.Yu. | 67 |
| Production of large steel castings in metal molds Lutsenko S.S., Pashinska O.G. | 70 |
| Mathematical analysis of the influence of the geometry of the deformation center on energy and power indicators Malii O.H., Titov A.V., Levchenko V.M. | 74 |
| Trends of rational use of manganese in converter melting technology Malii Kh.V., Hladkykh A.A. | 76 |

| | |
|--|------------|
| Influence of the chemical composition of cast iron on the performance of oxygen converters Mameshyn V.S., Doronin A.S. | 78 |
| Investigation of the influence of changes in the temperature of cast iron during its transportation on the indicators of the oxygen converter process Mameshyn V.S., Nefodov Ye.O. | 81 |
| On the possibility of steel saturation with nitrogen in the steel smelting process Medvedieva K.O., Stoianov O.M., Malii Kh.V. | 84 |
| Prospects for the development of pipe enterprises of Ukraine according to work results in the first half of 2023 Myronenko M.A., Korol R.M. | 87 |
| Modern trends in improving the processing of nickel metal waste and its alloys Nesterenko T.M., Nesterenko O.M., Didenko L.M. | 90 |
| Aspects of the development of the method for determining residual stresses in the metal of welded straight pipes of large diameter Ovsianykov V.V. | 92 |
| Methods of electromagnetic stirring of metal in the CCM mold Oleshko M.V., Malii Kh.V., Synehin Ye.V. | 96 |
| Structure and properties of a low-carbon steel wire after combined cold deformation Pashynska O.G., Skulskiy V.Yu., Boyko I.O. | 99 |
| The use of the results of the macro and microstructure research for the development of the production technology of commercial slabs produced from ingots of low-carbon steel grade S355 for EU-assets in the conditions of PJSC “Zaporizhstal” Pashynskiy V.V., Liolko O.O. | 102 |
| Structure aspects of mechanical properties of ductile iron formation Pashynskiy V.V., Pashynskaya O.G., Boyko I.O. | 106 |
| Development of production technology in order to obtain required mechanical characteristics due to the formation of an improved complex of structure and properties of 30MnB5 steel produced by PJSC “Zaporizhstal” Pashynskiy V.V., Tereshchenko A.H. | 109 |

| | |
|--|-----|
| Use of technological raw materials for obtaining aluminum magnesium spinel Prutskov D.V., Prokhorenko I.O. | 112 |
| Investigation of the causes of the metal breaks under the mould during continuous casting of steel Sanytskii V.V., Malii Kh.V., Synehin Ye.V. | 114 |
| Probabilistic approach to the methodology for regulating the chemical composition and predicting the properties of grey synthetic cast iron Sirenko K.A., Mazur V.L. | 116 |
| Blast furnace slag used in slag-forming materials for the ladle furnace process Stepanenko D.O. | 119 |
| Features of converting vanadium steelmaking iron Kharchuk F.L., Stoianov O.M. | 121 |
| Cold-solid mixtyre technology, how does it affect the quality of steel casting in the enterprise conditions Khorolska S.O., Pashinska O.G. | 124 |
| Crystallographic features of $\alpha \rightarrow \gamma$ recrystallization of ferrite alloys during carburization Chornoivanenko K.O., Movchan K.O. | 126 |
| Assessment of the efficiency of using waste of metallurgical enterprises with the purpose of resource and energy saving Yaholnyk M.V., Fedorov R.F. | 129 |
| CHALLENGES AND PROSPECTS FOR ENGINEERING EDUCATION TRANSFORMATION | |
| Effectiveness of using the case method during professionally oriented foreign language training of future engineers Burkovska O.Y. | 132 |
| Digitalization of education as a factor of modern education development Varekh N.V. | 135 |
| About forming the grammatical competence problems of engineering education students in the process of studying the business and academic Ukrainian Dvoriankin V.O. | 137 |

| | |
|---|-----|
| Communicative approach in learning a foreign language Dovhal I.A. | 140 |
| Organization of the study of differential equations in distance education Kolesnykov S.O. | 144 |
| Program of the discipline on the organization of scientific research for students of technical specialties of the master's level, studying in the dual form of education Kukhar V.V. | 146 |
| Creative methodologies in teaching english for higher engineering education students Ragulina N.V. | 152 |
| The history of establishment of industrial electrical locomotives engineering in Ukraine (1959–1968) Ruban M.Yu., Fomin A.V., Ponomarenko V.V. | 157 |
| Implementation of innovative formats of engineering education Khara M.V., Maslak G.V., Zhurba E.V., Boglaeva T.B. | 162 |
| Ways of increasing the motivation of technical students to learn English Khoroshailo O.S., Kochergina S.S. | 165 |
| Prospects of engineering education in the sphere of loading and unloading works Shatov S.V., Burmaka N.A., Khyzhniak L.N. | 167 |
| PRIORITIES FOR IMPROVING THE OPERATIONAL EFFICIENCY OF MINING COMPANIES | |
| Priorities for improving the operational efficiency of mining companies organization of technical diagnostics of mining excavators Borysov S.M. | 171 |
| Prospects of uniform approaches implementation to building the organizational structure of associated enterprises to increase the efficiency of business process management Buhlak K.A., Shevchenko N.Yu. | 173 |
| Adaptation of the production system of the mining complex as a reaction to the dynamics of the external environment Hryhoriev Yu.I., Sliusar S.V., Herasymchuk O.M., Serheiev P.S. | 176 |

| | |
|---|------------|
| Justification of the development methods of man-made deposits for increasing the efficiency of the mining complex Hryhoriev Yu.I., Shvets Ye.M., Hryhoriev I.Ye., Smirnov O.Ya..... | 179 |
| Perspective directions for ensuring the safety of workers and increasing the efficiency of constructing roads by header machines on coal seams prone to gas-dynamic phenomena Diedich I.O. | 182 |
| Transfer of employees between business units of the corporate structure as a human resource management tool Dolyntko O.O., Shevchenko N.Yu. | 184 |
| Development of preparatory entries driving and fastening technologies in the conditions of “KRASNOLIMANSKA” coal mine Kamenets V.I., Novikov M.O. | 187 |
| Study of the processes of movement of vehicles with a stepping motor Krupko I.V. | 191 |
| Justification of the possible area of adjustment of the mining works mode that ensures the achievement of the specified ore open-pit productivity Lutsenko S.O., Bohdanov D.O., Yakovenko S.V., Systierov O.V..... | 193 |
| Evaluation of the current state of the management system of the motor transport shop Mints O.Yu., Pinchuk O.M..... | 196 |
| Reclamation technology of an open-pit space with completed mining operations Pyzhyk A.M., Krasulia O.O..... | 198 |
| Improvement of the current regulatory framework of coal mining enterprises Piliuhyn V.I., Kamenets V.I., Anhelovskyi O.A..... | 200 |
| Theoretical foundations of the development of the iron ore industry in Ukraine Romanenko A.O. | 202 |
| Prospective ways of increasing the operational efficiency of Ukrainian coal mines: case study prjsc pokrovske colliery Sakhno I.G., Sakhno S.V..... | 204 |
| Iron ore mining’s material flow Cherevatskyi D.Yu., Bash V.O., Bojko O.V..... | 208 |

**SOFTWARE AND INFORMATION SUPPORT
FOR COMPUTERIZED SYSTEMS
OF BUSINESS PROCESS MANAGEMENT**

Justification for the development of a software system for determining the quality characteristics of scrap metal using computer vision technology
Andrieienkov A.V...... 212

Study of the advantages of the combination of predicate logic, fuzzy c-means and the ontological model to increase the efficiency of data processing in organizational and technical complexes
Balabolko O.R., Sahaida P.I...... 215

Analysis of methods and models for designing a budgetary control system
Bugaiets I.V., Sahaida P.I...... 217

Digital twins, intelligent systems, and assistants
Verbato K.Ye...... 220

Research and design of software components for the intelligent system of monitoring the state of uninterrupted power supply devices of the APCS equipment of the blast-furnace department of “KAMET-STEEL”
Hedikov V.O. 223

Startup-project for the development of complex software for researching the food products composition
Zditovetskyi Yu.S., Bisikalo O.V., Ivanov Yu.Yu...... 226

Selection and comparison of ERP systems for implementation at the repair and mechanical enterprises of LLC “METINVEST HOLDING”
Kazemirenko Yu.V., Shmatko O.V. 228

Development of a mathematical model for the control system of an experimental setup for high-pressure torsion processing of hollow blanks
Kasianiuk O.S...... 233

Research of methods, models and information technologies using neural networks in increase of productivity of ore enriching factories
Kostikov O.A., Konyk A.B. 236

Defining the problem for investigating machine learning methods for procurement data analysis and forecasting of an IT enterprise
Kripak S.A., Moskalenko V.V...... 241

| | |
|--|------------|
| Market research of supply chain management systems and rationale for the software application development for transportation management Moskalenko V.V., Virych V.V. | 243 |
| The method of development and integration of engineering activity information support subsystems based on the categorical-ontological approach Sahaida P.I., Vasylieva L.V., Getman I.A. | 247 |
| Possibilities of automating the process of creating digital samples of branded products at Metinvest Group enterprises Smyrnov O.V. | 251 |
| Development and improvement of the intelligent module “Tags about batch and containers” for automated printing of tags in the “PlasmIS” ERP system Starzhynskiy V.Yu. | 254 |
| Research of methods, models and information technologies for increasing the static load of vehicles with artificial loads at Metinvest Group Shelest S.O., Sahaida P.I. | 259 |
| Research and design of software components for an intelligent chatbot of the company’s service department Shmatko O.V., Hlibov V.H. | 261 |
| Transformation of the admission process to METINVEST POLYTECHNIC through the implementation of modern digitalization tools Yakymov Yu.M., Shevchenko N.Yu. | 266 |