

Science and Education

*MATERIALS
OF THE IV INTERNATIONAL
RESEARCH AND PRACTICE CONFERENCE
Vol. I*

October 30th – 31st, 2013

Munich, Germany 2013

Single photocopies of single chapters may be made for personal use as allowed by national copyright laws. Permission of the Publisher and payment of a fee is required for all other photocopying, including multiple or systematic copying, copying for advertising or promotional purposes, resale, and all forms of document delivery. Special rates are available for educational institutions that wish to make photocopies for non-profit educational classroom use.

Permission of the Publisher is required for all other derivative works, including compilations and translations. Electronic Storage or Usage Permission of the Publisher is required to store or use electronically any material contained in this work, including any chapter or part of a chapter. Except as outlined above, no part of this work may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the Publisher.

Science and Education [Text] : materials of the IV international research and practice conference, Vol. I, Munich, October 30rd – 31st, 2013 / publishing office Vela Verlag Waldkraiburg – Munich – Germany, 2013 – 396 p.

ISBN 978-3941352-84-1

The collection of materials of the IV international research and practice conference “Science and Education” is the research and practice edition. It gives an opportunity for scientists and experts to get acquainted with achievements of the priority directions of modern science, to show the results of the researches, to exchange experience, to publish scientific articles that will promote productive scientific work, realization of creative potential, origin of new ideas and establishment of friendly relations and possibilities for cooperation.

It includes the scientific articles of students, postdoctoral students, graduate students, research scientists of higher education institutions.

Publishing office Vela Verlag Waldkraiburg – Munich – Germany 2013
Reichenberger Str. 7, 84478 Waldkraiburg, Germany
Tel.: +49 (0) 8638 / 885 227
www.vela-verlag.de

Forth edition 2013

ISBN 978-3941352-84--1



© 2013 Vela-Verlag, Waldkraiburg – Munich – Germany
© 2013 Strategic Studies Institute
© 2013 Article writers
© 2013 All rights reserved

CONTENT

PREFACE	10
----------------------	----

PHYSICS AND MATHEMATICS

<i>Andreev A.F., Andreeva I.A.</i> PHASE PORTRAITS OF ONE ELSE NEW FAMILY OF CUBIC SYSTEMS IN A POINCARÉ CIRCLE.....	11
--	----

BIOLOGICAL SCIENCES

<i>Abitayeva G.K., Bekenova N.E., Akhmetova G.N., Anuarbekova S.S., Almagambetov K.Kh.</i> INFLUENCE OF MEDICAL PLANTS' EXTRACTS ON PROBIOTIC MICROORGANISMS.....	14
--	----

<i>Chekurov I.V., Abramova L.L.</i> LAWS OF ADAPTIVE REMODELING OF THYROCITES' ULTRASTRUCTURES OF RABBITS IN IODINE DEFICIENCY.....	18
---	----

<i>Nifontova O.L., Privalova A.G., Karbainova Yu.V., Tankenov A.S., Konkov V.Z., Melnikova K.S.</i> ST-INTERVAL OF LEARNERS OF YUGRA OF AGE FROM 7 TO 17 YEARS OLD IN ACCORD WITH STANDARD ELECTROCARDIOGRAPHY.....	20
---	----

<i>Sibirkina A.R.</i> BIOGEOCHEMICAL FEATURES OF THE CONTENT OF HEAVY METALS IN THE SANDS OF A PINE FOREST SEMIPALATINSK AREA.....	23
--	----

<i>Vishnevskaya T.Ja., Abramova L.L.</i> MORPHOFUNCTIONAL CHARACTERISTICS OF THE SPLEEN AND DYNAMICS OF RABBIT BLOOD INDEXES UNDER STRESS AND ITS CORRECTION WITH «RONCOLEUKIN».....	28
--	----

<i>Yastreb O.V.</i> CONTENT OF PHOSPHOR IN THE GROUND AND DACTYLIS GLOMERATA L. IN THE KALININGRAD REGION.....	31
--	----

TECHNICAL SCIENCES

<i>Aripov M.M., Muhamediyeva D.K.</i> NUMERICAL MODELING OF POPULATION TASKS WITH NONLOCAL NONLINEARITY.....	35
---	----

<i>Askarova A., Bolegenova S., Bekmukhamet A., Maximov V., Beketayeva M., Ospanova Sh.</i> NUMERICAL RESEARCH OF CONVENTIONAL COMBUSTION MODE	46
<i>Atkina V.S., Nikishova A.V.</i> THE STUDY AND APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES FOR TRAINING SPECIALISTS IN THE FIELD OF INFORMATION SECURITY	50
<i>Belous V.V., Karpenko A.P., Sokolov N.K.</i> SYNTHESIS OF OPTIMAL LEARNING TRAJECTORIES IN AN ADAPTIVE LEARNING SYSTEM	58
<i>Borisov V.V., Goncharov M.M.</i> MODELING OF THE INFORMATION SECURITY EVENTS BASED ON FUZZY AUTOMATA	64
<i>Chernjavsky N.I.</i> RECUPERATIVE IMPULS CURRENT GENERATOR WITH INDUCTIVE ACCUMULATION OF ENERGY FOR CHARGING OF AUTOMOBILE ACCUMULATIONS	68
<i>Gadaborsheva T.B., Efremova G.S., Pen'kova V.V., Zahar'ina A.Y.</i> CHARACTERISTIC FEATURES OF FORMING OF AN AIR ENVIRONMENT IN ENTERPRISES DEPENDING ON SCOPE-PLANNING AND TECHNOLOGICAL POINTS	79
<i>Galiev I.G., Khusainov R.K.</i> TRACTORS PERFORMANCE ASSURANCE BY MEANS OF THEIR DIFFERENTIATION ON AGRICULAR FUNCTIONS	86
<i>Gimarov V.V., Dli M.I., Ivanova I.V.</i> LOCAL PARAMETRIC ALGORITHMS AS A TOOL OF CHOICE MULTI-AGENT SYSTEM CLASS	90
<i>Grishchuk R.V., Pilkevich I.A., Kotkov V.I., Bordiug N.S.</i> SYNTHESIS AND ANALYSIS OF MULTICRITERION DIFFERENTIAL GAMING MODELS AND SIMULATION MODELS OF PROCESS OF CYBERFALLING	93
<i>Gryadunov I.M., Radchenko S.Yu., Dorokhov D.O.</i> HARDENING TECHNOLOGY OF HOLLOW AND AXISYMMETRIC DETAILS BY MEANS OF SEVERE PLASTIC DEFORMATION IN CONDITIONS OF COMPLEX LOCALIZED LOADING	97
<i>Khristoforova A.G.</i> INNOVATIVE POTENTIAL OF NORTH-EASTERN FEDERAL UNIVERSITY	102
<i>Lobasenko B.A., Kotlyarov R.V.</i> MEMBRANE APPARATUS AND PLANTS DEVELOPMENT WITH POLARIZATION LAYER BAFFING	106
<i>Malyshev V.I., Selivanov A.S.</i> INVESTIGATION OF ADDITIONAL ULTRASONIC POWER INFLUENCE IN FINISHING AND HARDENING TREATMENT WITH A BOWL-SHAPED INDENTOR ON QUALITY PARAMETERS OF MACHINED SURFACES	108
<i>Mamatov Sh. M., Shamsutdinov B.X.</i> EXPERIMENTAL STUDY PROCESS OF DRYING CABBAGE	113
<i>Mesnyakin M.V., Merko M.A., Kolotov A.V., Mityaev A.Ye.</i> IDENTIFICATION OF THE SHAPE OF CURVE JOINING CENTERS OF MECHANISMS' ROLLING BODY SYSTEMS	116

<i>Sevrugina N.S.</i> EVALUATION METHODOLOGY TECHNICAL SECURITY BUILDING AND ROAD MACHINES	121
<i>Sukhorukov D.V., Borodulin D.M.</i> DEVELOPMENT OF CENTRIFUGAL MIXING UNIT FOR MEDICAL FOR VERTEBROPLASTY CEMENT COMPOSITIONS	127
<i>Svyatovets K.V.</i> CALCULATION OF BROADENING COEFFICIENT USING FORMULA BY TRINKS FOR CALIBRES: OVAL-SQUARE, RHOMB- SQUARE, RHOMB-RHOMB, OVAL-CIRCLE	130
<i>Taskarina A.ZH., Mendebaev T.M., Dudak N.S., Kassenov A.ZH., Itybaeva G.T., Mussina ZH.K., Ordabaev A.</i> EXPERIMENTAL RESEARCH OF HOLE PROCESSING BY INCISAL COMPILED REAMERS.....	138
<i>Velkin V.I., Shcheklein S.E., Trapeznikov M.L., Karaulov A.V.</i> MODULAR MICRO CLUSTERS OF RES OF HIGH OPERATIONAL SYSTEMS FOR REMOTE AREAS OF RUSSIA	140
<i>Tsytovich LI, Brylina O.G., Dudkin M.M., Tyugay A.V., Lopuchova E.A.</i> ANALYSIS OF STATIC NOISE STABILITY OF THE COMMUNICATION LINKS WITH WIDTH- AND FREQUENCY-WIDTH-PULSE CARRIER OF INFORMATION	144
<i>Yusupbekov N.R., Igamberdiev H.Z., Guliamov Sh.M., Artikov S.Z., Ergashev F.A.</i> THE FEW POINTS OF RAISING THE LEVEL OF AUTOMATION THE TECHNOLOGICAL OBJECTS	151
<i>Zharylgapov S.M., Montayev S.A., Bisenov K.A., Taskaliyev A.T.</i> RESEARCH OF A POSSIBILITY OF USAGE OF OIL SLUDGE IN TECHNOLOGY OF WALL CERAMICS ON THE BASIS OF LOESS LOAM.....	154
<i>Zhatkin S.S., Parkin A.A.</i> THE FEATURES OF ABRASIVE WEAR OF THE PLASMA BUILT-UP COMPOSITE MATERIALS WOKA PTA-6040 AND MICRO-MELT NT-60	155

AGRICULTURAL SCIENCES

<i>Dolmatova L.G., Petrova I.A., Solomkina E.A.</i> ORGANIZATIONAL AND ECONOMIC CONCEPTS OF PEASANT (FARM) ENTERPRISES' FUNCTIONING IN THE MODERN PERIOD OF DEVELOPMENT OF MARKET RELATIONS IN RUSSIA.....	159
<i>Khlyustov V.K., Koreshkov N.V., Gemonov A.V.</i> WACHSTUM VON KIEFERNBESTÄNDEN NACH ART DER WALD IN VERSCHIEDENEN ARTEN VON WALDWACHSTUM	163
<i>Nizamov R.M., Ziganshin R.B., Suleymanov S.R., Zyabbarov A.N.</i> OPTIMIZATION OF SOME ELEMENTS OF CULTIVATION TECHNOLOGY IN THE REPUBLIC OF TATARSTAN.....	168
<i>Schigapov I.I.</i> IMPROVING THE TECHNOLOGY AND PRODUCTS FOR CLEANING AND PROCESSING OF SLURRY FROM LIVESTOCK BUILDINGS	170

EXPERIMENTAL RESEARCH OF HOLE PROCESSING BY INCISAL COMPILED REAMERS

**Taskarina A.ZH.¹, Mendebaev T.M.², Dudak N.S.³, Kassenov A.ZH.⁴, Itybaeva G.T.⁵,
Mussina ZH.K.⁶, Ordabaev A.⁷®**

^{1,2} Kazakh National Technical University of K. I. Satpayev, Satpayev str. 22, 050010, Almaty
^{3,4,5,6,7} Pavlodar State University of S. Toraigrov, Lomova str. 64, 140008, Pavlodar

Kazakhstan

Abstract

Experiments were carried out with the use of mathematical tools such as multi-factor experiment 2³. As the optimization parameter, the following elements have been selected: deviation diameter and the burr; factors: frequency of spindle speed, feed and the length of treatment. We carry out a statistical analysis of the results of the regression equation (Student criterion and Fisher's exact test). According to the yielded findings, adequate model we calculate the value of the studied parameters (diameter deviation, surface roughness) for any combination of values of the factors that are in the area of experimentation. The analysis of obtained dependences revealed that by increasing the rotational speed and reduction of the feed, diameter deviation and surface roughness are bound to decrease.

The processing precision of holes of 5-6 match to the degree of accuracy, quality class 1-2 that is higher than the processing hole boring cutters and reamers standard. The surface roughness within the Ra 0,8 ... 3,20 microns.

Keywords: cutting, hole, reamer, quality, accuracy, surface roughness, experiment, factor, model.

Experiments were carried out with the use of mathematical tools such as multi-factor experiment 2³ [1].

The treatment of holes by incisal compiled reamers with peakless tines was carried out on a vertical drilling machine of 2A135 type. Processing holes of 40 mm in diameter on the material - steel St3 mark length 0,5 d, d and 1,5 d, where d is diameter of the hole.

As the optimization parameter, the following elements have been selected: deviation diameter and the burr; factors: frequency of spindle speed (max - 140 turnover / min ; min - 68 r turnover / min) , feed (max - 1,22 mm / turnover ; min - 0,25 mm / v) and the length of treatment (max - 60 mm ; min - 20).

According to [1], upper and lower variation limits are set, planning matrix has been developed. According to the presented formulas [3, 4], the necessary calculations, the results are summarized in tables 1 and 2.

It is necessary to check the reproducibility of the experiment by Cochran's criteria before one defines a model of the experiment in the form of the regression equation.

Then we carry out a statistical analysis of the results of the regression equation, which includes verification of the following:

- significance of the coefficients of equation (Student criterion);
- suitability or adequacy of the developed equation or a description of the process (Fisher's exact test).

Table 1

The deviation of the diameter of the holes Ø 40 mm

Number of experience			Results y_i			The average value \bar{y}	Dispersion S_i^2	The optimization's option \hat{y}
1	9	17	0,018	0,399	0,014	0,144	0,049	0,068
2	10	18	0,000	0,002	0,016	0,006	0,00008	0,082
3	11	19	0,025	1,028	0,050	0,368	0,327	0,443
4	12	20	0,018	0,399	0,016	0,145	0,049	0,069
5	13	21	0,014	0,012	0,014	0,013	0,000001	0,185
6	14	22	0,011	0,000	0,005	0,005	0,00003	0,070
7	15	23	1,050	0,050	1,022	0,707	0,324	0,632
8	16	24	0,012	0,006	0,012	0,010	0,092	0,086

© Taskarina A.ZH., Mendebaev T.M., Dudak N.S., Kassenov A.ZH., Itybaeva G.T., Mussina ZH.K., Ordabaev A., 2013

Table 2

Surface roughness processing holes Ø 40 mm

Number of experience			Results y_i			The average value \bar{y}	Dispersion S_i^2	The optimization's option \hat{y}
1	9	17	1,25	1,00	1,25	1,167	0,021	1,290
2	10	18	0,80	1,10	0,80	0,900	0,030	0,777
3	11	19	3,20	2,50	3,20	2,967	0,163	2,844
4	12	20	2,00	1,60	1,60	1,733	0,053	1,856
5	13	21	1,60	1,60	1,25	1,483	0,041	1,475
6	14	22	1,00	0,80	1,00	0,933	0,013	1,056
7	15	23	3,20	2,50	2,00	2,567	0,363	2,690
8	16	24	2,00	1,60	2,50	2,033	0,092	1,910

The significance's verification of the coefficients is carried out using the Student criterion according to which non-significant coefficients are excluded from the regression equation.

After the exclusion of non-significant regression coefficients, we got the model in coded variables

$$y = 0,175 - 0,133x_1 + 0,133x_2 \quad (1)$$

According to the yielded findings, adequate model we calculate the value of the studied parameters (diameter deviation, surface roughness) for any combination of values of the factors that are in the area of experimentation. The magnitude of the coefficient in front of this or that factor in the model can be judged on the impact of this factor on the investigated parameter. The higher the numerical value of the coefficient, the greater the effect of a factor. A sign of the coefficient indicates the direction of impact factor, i.e. with the plus sign, an increase in the numerical values of the coefficient leads to the increase of the explored parameter.

With the minus sign - decrease [3, 4].

To obtain the model numbers of variables n , S , L we must substitute X_1 , X_2 with the expressions

$$X_1 = \frac{2(\ln \hat{X}_1 - \ln 140)}{\ln 140 - \ln 68} + 1, \quad X_2 = \frac{2(\ln \hat{X}_2 - \ln 1,22)}{\ln 1,22 - \ln 0,25} + 1 \quad (2)$$

The transformation formulas are obtained by substituting the upper and lower levels of the factors in (1).

$$\ln \Delta d = 0,175 - 0,133 \left[\frac{2(\ln n - \ln 140)}{\ln 140 - \ln 68} + 1 \right] + 0,133 \left[\frac{2(\ln S - \ln 1,22)}{\ln 1,22 - \ln 0,25} + 1 \right] \quad (3)$$

We find the dependence of the deviation of the diameter of the factors studied the processing of the hole

$$\Delta d = 7,09 \frac{S^{0,167}}{V^{0,368}} \quad (4)$$

Similarly, data processing is performed to determine the surface roughness of the hole

$$Ra = 128,36 \frac{S^{1,909}}{V^{0,897}} \quad (5)$$

Thus, based on the dependences of the model, the rotational speed, pitch and length of the cutting diameter deviation designation values, surface roughness values of any combination of factors that are in the experiment, we get the following conclusions:

1. The processing precision of holes of 5-6 match to the degree of accuracy, quality class 1-2 that is higher than the processing hole boring cutters and reamers standard.
2. The surface roughness within the Ra 0,8 ... 3,20 microns.
3. The analysis of obtained dependences revealed that by increasing the rotational speed and reduction of the feed, diameter deviation and surface roughness are bound to decrease.
4. In the processing of the cutting holes by incisal compiled reamers with peakless tines, the length of processing does not have a significant impact on diameter deviation, as evidenced by the results of experimental research.

References

- [1] Taskarina A.ZH., Mendebaev T.M., Dudak N.S., Kassenov A.ZH. Planning for experimental studies of hole team incisal compiled reamer / / Abstracts of the international scientific-practical conference "Innovative technologies , equipment and materials in mechanical engineering " – Almaty : KazNTU , 2012. – P. 152-156.
- [2] Dalsky A.M., Kosilova A.G., Meshcheriakova R.K., Suslov A.G. Reference technologist mechanic. In 2 vols. V.1 . - 5th ed., Rev. and add. – Moscow Engineering - 1, 2001. – 912 p.
- [3] Kokarev V.I. Application of statistical experimental design techniques in the identification of the cutting process. - Alma- Ata: Vol. " Kitap ", 1985 . – 52 p.
- [4] Vidmaer A.E., A. Sorokin, V.A. Dahno Application of the theory of experimental trials for machine parts : Guidelines for the implementation of UIRS the discipline " machine parts ". – Alma-Ata , ed. RUMK 1987. – 23 p.

MODULAR MICRO CLUSTERS OF RES OF HIGH OPERATIONAL SYSTEMS FOR REMOTE AREAS OF RUSSIA

Velkin V.I. ¹, Shcheklein S.E. ², Trapeznikov M.L. ³, Karaulov A.V. ⁴®

^{1,2} Ural Federal University named after the first President of Russia B.N.Yeltsin;

^{3,4} Research and Production Enterprise "Contactor-M"

Russia

Abstract

In the article we envisage the relevance of the use of modular portable high operational systems - clusters of renewable energy with a set of renewable energy sources. Modular design of the micro-cluster RES and scale of clusters of RES by capacity are presented in this article. The necessity and potential demand in clusters of decentralized renewable energy to remote areas of Russia are demonstrated in this article.

Keywords: renewable energy, renewable energy sources (RES), clusters of renewable energy, solar, wind, hydro-power plants.

Scientific edition

Science and Education

*MATERIALS
OF THE IV INTERNATIONAL
RESEARCH AND PRACTICE CONFERENCE
Vol. I*

October 30th – 31st, 2013

Passed for printing 27.11.2013. Appearance 16.12.2013.
Format 170×24/8. Typeface Arial.
Conventional printed sheets 23,01. Circulation 400 copies. Order 82.

Vela Verlag Waldkraiburg – Munich – Germany 2013.

The publisher «Strategic Studies Institute».