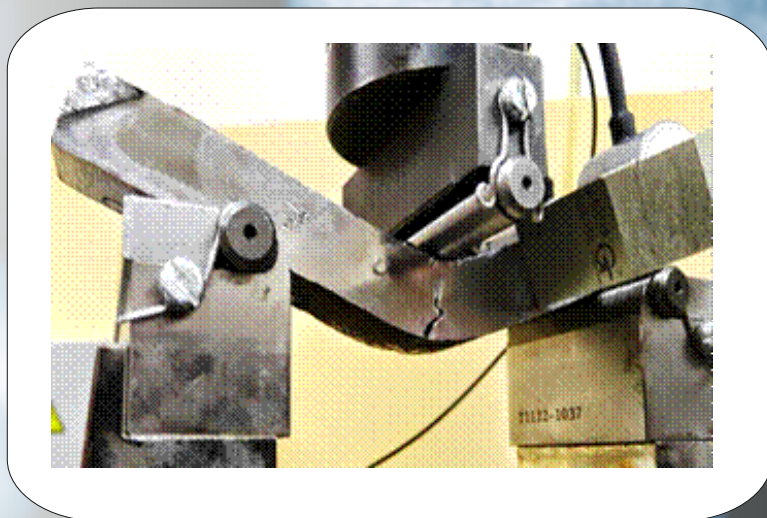


International journal
for science, technics and
innovations for the industry



MACHINES
TECHNOLOGIES
MATERIALS

YEAR X **Issue 2 / 2016** **ISSN 1313-0226**



Published by
Scientific technical
Union of Mechanical Engineering



MACHINES, TECHNOLOGIES, MATERIALS

INTERNATIONAL JOURNAL

PUBLISHER

SCIENTIFIC TECHNICAL UNION OF MECHANICAL ENGINEERING

108, Rakovski Str., 1000 Sofia, Bulgaria

tel. (+359 2) 987 72 90,

tel./fax (+359 2) 986 22 40,

journal@mech-ing.com,

www.mech-ing.com/journal

ISSN 1313-0226

YEAR IX, ISSUE 2 / 2016

EDITORIAL BOARD

Editor-in-chief: Prof. Dr. Mitko Mihovski – Chairman of the Scientific Council of the STUnion of Mechanical Engineering

AKADEMIC CONCEPTIONAL BOARD

Acad. Vassil Sgurev

Acad Yachko Ivanov

Acad Vladimir Klyuev

Acad. Rivner Ganiev

Corr. mem. Georgi Mladenov

Corr. mem. Dimitar Buchkov

Corr. mem. Stefan Hristov

Corr. mem. Venelin Jivkov

Corr. mem. Anatoliy Kostin

Corr. mem. Edward Gorkunov

EDITORIAL COUNCIL

Prof. D.Sc. Georgi Popov

Prof. D.Sc. Alexander Skordev

Prof. D.Sc. Nikola Rashkov

Prof. D.Sc. Dimitar Stavrev

Prof. D.Sc. Hristo Shehtov

Prof. Dr. Todor Neshkov

Prof. Dr. Dimitar Damianov

Prof. Dr. Kiril Arnaudov

Prof. Dr. Snejana Grozdanova

Prof. Dr. Vassil Georgiev

Assoc. Prof. Lilo Kunchev

EDITORIAL BOARD – EXPERTS AND REVIEWERS

FROM BULGARIA

Prof. D.Sc. Nyagol Manolov

Prof. D.Sc. Vitan Galabov

Prof. D.Sc. Emil Momchilov

Prof. D.Sc. Emil Marinov

Prof. D.Sc. Dimitar Katzov

Prof. D.Sc. Stavri Stavrev

Prof. D.Sc. Georgi Raychevski

Prof. D.Sc. Ivan Yanchev

Prof. D.Sc. Marin Stoychev

Prof. D.Sc. Roman Zahariev

Prof. D.Sc. Vassil Mihnev

Prof. D.Sc. Valentin Abadjiev

Assoc. Prof. Dimitar Stanchev

Assoc. Prof. Milcho Angelov

Assoc. Prof. Mihail Mihovski

Assoc. Prof. Radi Radev

Assoc. Prof. Georgi Todorov

Assoc. Prof. Simeon Petkov

Assoc. Prof. Petar Dobrev

Assoc. Prof. Nikolay Piperov

FOREIGN MEMBERS

PD. D. PE Assoc. Prof D.Midaloponlas

Prof. Dr. Athanasios Mihaildis

Prof. Amos Notea

Prof. Dr. Eng. Airon Kubo

Prof. Dr. Eng Georg Dobre

Prof. Dr. Dimitrov Dimitar

Prof. Dr. Mohora Cristina

Prof. Dr. Popa Marcel

Prof. Dr. Sobczak Jerzy

Prof. Dr. Tamosiuniene Rima

Prof. Alexander Dimitrov

Prof. dr. Marian Tolnay

Prof. dr. Mikolas Hajduk

The current issue and the first issue of  journal and the conditions for publication can be find on

www.mech-ing.com/journal

CONTENTS

DENSITY FUNCTIONAL STUDY of LuSe and LuTe INTERMETALLIC COMPOUNDS

Assoc. Prof. Dr. Nihat Arikan, Asist. Prof. Dr. Osman Örneç, Assoc. Prof. Dr. Şule Uğur, Prof. Dr. Gökay Uğur 3

SIMULTANEOUS THERMAL ANALYSIS ON PLASMA-AIDED CAPILLARY IMPREGNATION FOR EUROPEAN WHITE PINE FLAME RETARDATION IMPROVEMENT

Assist. Prof. Ivanov I., Assoc. Prof. Gospodinova D. Ph.D., Prof. Dineff P. Ph.D. 5

INVESTIGATION OF FAILURE OF FREIGHT TRUCKS SIDE FRAMES USING ACOUSTIC EMISSION

Dr. Sci. Nikulin S.A., Ph.D. Khazhin V.G., Nikitin A.V., Ph.D. Rogachev S.O., Khatkevich V.M., Ph.D. Li E.V., Neçaykina T.A. 9

BASIC APPROACHES TO THE STUDY OF THE STRUCTURE AND PROPERTIES OF THIN OXIDE LAYERS ON THE EXAMPLE OF THE OXIDE FILMS OF ZIRCONIUM ALLOYS

Ph.D. Koteneva M.V., Dr. Sci. Nikulin S.A., Ph.D. Rozhnov A.B. 11

INVESTIGATION OF HIGH-TEMPERATURE MULTI-LAYER MATERIAL BASED ON VANADIUM ALLOY AND STAINLESS STEEL

Nikulin S., Neçaykina T., Rozhnov A., Rogachev S. 13

THE EFFECT OF CHEMICAL COMPOSITION ON PROPERTIES OF ROCK MELTS

Eng. Diduk I., Prof., Dr. Sc. Bagliuk G.A. 15

INVESTIGATION OF PROPERTY OF POLYCRYSTALLINE DIAMOND PURIFIED BY TECHNOLOGY OXIDATIVE ALKALINE MELTS

PhD.1 Kozub P.A, M.Sc., Chernikov I.A., Dr.Sc., Bagliuk G.A., PhD. Kurovskyi V.Ya., PhD.1 Kozub S.N. 19

AN EXPERIMENTAL INVESTIGATION OF LIME BASED PLASTERS MOISTURE AND TEMPERATURE INDUCED DEFORMATION.

Assoc. Prof., RNDr. Lukoviçová J.PhD., Ing. Pavlendová G. PhD., Assoc.Prof., Ing. Kubliha M. PhD., RNDr. Šín P. PhD. 21

ANALYSIS OF PARALLEL RESONANT CONVERTERS WITH COMPUTER SIMULATIONS

Assist. prof. Dr. Eng. Stefanov G. , Assos. prof. Dr. Eng. Sarac V., Assist. Msc. Eng. Kukuseva Paneva M. 24

STUDY OF THE CAPACITY OF A FANUC M430i-A/4FH ROBOT TO PERFORM TECHNOLOGICAL OPERATIONS

Prof. D.Sc. Guergov S., M.Sc. Beevski L. 28

COMPARATIVE ANALYSIS OF CONTEMPORARY CASE BASED REASONING SOFTWARE FRAMEWORKS

Assoc. Prof. Atanassov A. 31

ONTOLOGY BASED DATA AND INFORMATION INTEGRATION IN BIOMEDICAL DOMAIN

Assist. Prof. Dr. Gocheva D. G., Assist. Eng. Eminova H. M., Prof. Dr. Batchkova I. A. 35

METAMODELS BASED ONTOLOGY DEVELOPMENT TO ACHIEVE STANDARD-COMPLIANT PROJECT MANAGEMENT

M.Sc. Stoyanova.T. 39

DETERMINATION OF THE OPTICAL PROPERTIES OF BULGARIAN HONEY AND THEIR APPLICATION TO HONEY DISCRIMINATION

Prof. Dr. Tsankova D. D., Ass. Prof. Dr. Nikolova K., Prof. Dr. Evtimov T., Assist. Prof. Dr. Lekova S. D. 43

MODEL DRIVEN DEVELOPMENT OF AGENT BASED AMBIENT INTELLIGENCE PLACES WITH SERVICE ORIENTED ARCHITECTURE

Assist. Prof. Dr. Antonova I. D., Prof. Dr. Batchkova I. A., Eng. Ivanova Tz. 47

AN APPROACH FOR COMBINING THE CAPABILITIES OF IMMERSIVE VIRTUAL REALITY AND MODERN CAD-CAM SOFTWARE SYSTEMS TO CREATE VIRTUAL MODELS OF WORKSHOPS FOR MECHANICAL PROCESSING

M.Sc. Slavov, Stoyan D., PhD. 51

SOME PROJECT MANAGEMENT TECHNIQUES

M.Sc. Ivanova Milka 55

COMPUTER-AIDED DESIGN OF POWER SUPPLY SYSTEMS OF VEHICLES

Cand. Sci. (Tech.), Senior researcher Ferenets A., Cand. Sci. (Tech.) Fedorov E. 59

CONTEMPORARY METHODS FOR MANAGEMENT AND ORGANISATION OF MULTIMODAL TRANSPORTATION

Eng. Nakova Kate 61