

International journal
for science, technics and
innovations for the industry

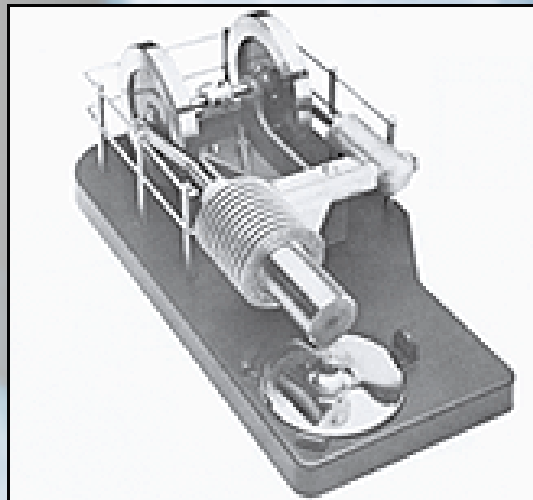


MACHINES
TECHNOLOGIES
MATERIALS

PRINT ISSN 1313-0226
WEB ISSN 1314-507X

Issue **12** / 2016

YEAR X



Published by
Scientific technical
Union of Mechanical Engineering



MACHINES. TECHNOLOGIES. MATERIALS

INTERNATIONAL SCIENTIFIC 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,

office@stumejournals.com

www.stumejournals.com

ISSN PRINT 1313-0226, ISSN WEB 1314-507X, YEAR X, ISSUE 12 / 2016

EDITOR-IN-CHIEF

Prof. D.Sc. DHC Georgi Popov,

President of Bulgarian Scientific and Technical Union of Mechanical Engineering

EDITORIAL BOARD

MEMBERS

SCIENTIFIC COMPETENCE

Prof. Dimitar Damyanov	Automatisation of production
Prof. Dimitar Karaivanov	Mechanics of machines
Prof. Dimitar Stavrev	Technologies and materials
Prof. Dimitar Yonchev	National and industrial security
Prof. Galina Nikolcheva	Machines tools and technologies
Prof. Hristo Shehtov	Automatisation of production
Prof. Idilija Bachkova	Automatisation of production
Prof. Ivan Kralov	Mechanics of machines
Prof. Ivan Parshorov	Technologies and materials
Prof. Ivan Yanchev	Machines and technologies
Prof. Ivo Malakov	Automatisation of production
Prof. Kiril Angelov	Industrial Management
Prof. Lilo Kunchev	Transport Equipment and Technology
Prof. Lubomir Dimitrov	Machines and technologies
Prof. Miho Mihov	Agricultural machinery
Prof. Miroslav Denchev	Ergonomics and design
Prof. Mladen Velez	Economics and Marketing
Prof. Nikolay Diulgerov	Technologies and materials
Prof. Ognyan Andreev	Production management
Prof. Petar Kolev	Transport Equipment and Technology
Prof. Roman Zahariev	Robotics
Prof. Sasho Guergov	Robotic systems and technology
Prof. Tsanka Dikova	Technologies and materials
Prof. Vitan Galabov	Mechanics of machines



MACHINES. TECHNOLOGIES. MATERIALS

INTERNATIONAL SCIENTIFIC JOURNAL

ISSN PRINT 1313-0226, ISSN WEB 1314-507X, YEAR X, ISSUE 12 / 2016

EDITORIAL BOARD FOREIGN MEMBERS

Prof. Adel Mahmoud	IQ	Prof. Marian Tolnay	SK
Prof. Ahmet Ertas	TR	Prof. Mark Easton	AU
Prof. Andonaq Londo	AL	Prof. Mart Tamre	EE
Prof. Andrei Firsov	RU	Prof. Maryam Ehteshamzade	IR
Prof. Andrzej Golabczak	PL	Prof. Michael Evan Goodsite	DK
Prof. Anita Jansone	LV	Prof. Movlazade Vagif Zahid	AZ
Prof. Aude Billard	CH	Prof. Natasa Naprstkova	CZ
Prof. Bojan Dolšak	SI	Prof. Oana Dodun	RO
Prof. Christian Marxt	LI	Prof. Oleg Sharkov	RU
Prof. Dale Carnegie	NZ	Prof. Páll Jensson	IS
Prof. Ernest Nazarian	AM	Prof. Patrick Anderson	NL
Prof. Esam Husein	KW	Prof. Paul Heuschling	LU
Prof. Ewa Gunnarsson	SW	Prof. Pavel Kovac	RS
Prof. Filipe Samuel Silva	PT	Prof. Per Skjerpe	NO
Prof. Francisco Martinez Perez	CU	Prof. Péter Korondi	HU
Prof. Franz Haas	AT	Prof. Peter Kostal	SK
Prof. Genadii Bagliuk	UA	Prof. Juan Alberto Montano	MX
Prof. Georg Frey	DE	Prof. Renato Goulart	BR
Prof. Gregory Gurevich	IL	Prof. Roumen Petrov	BE
Prof. Haydar Odinaev	TJ	Prof. Rubén Darío Vásquez Salazar	CO
Prof. Hiroyuki Moriyama	JP	Prof. Safet Isić	BA
Prof. Iryna Charniak	BY	Prof. Sean Leen	IE
Prof. Ivan Svarc	CZ	Prof. Shi Xiaowei	CN
Prof. Ivica Veza	HR	Prof. Shoirdzan Karimov	UZ
Prof. Jae-Young Kim	KR	Prof. Sreten Savićević	ME
Prof. Jerzy Jedzejewski	PL	Prof. Stefan Dimov	UK
Prof. Jean-Emmanuel Broquin	FR	Prof. Svetlana Gubenko	UA
Prof. Jordi Romeu Garbi	ES	Prof. Sveto Cvetkovski	MK
Prof. Jukka Tuhkuri	FI	Prof. Tamaz Megrelidze	GE
Prof. Kazimieras Juzėnas	LT	Prof. Tashtanbay Sartov	KG
Prof. Krasimir Marchev	USA	Prof. Teimuraz Kochadze	GE
Prof. Krzysztof Rokosz	PL	Prof. Thorsten Schmidt	DE
Prof. Leon Kukielka	PL	Prof. Tonci Mikac	HR
Prof. Mahmoud El Gammal	EG	Prof. Vasile Cartofeanu	MD
Prof. Manolakos Dimitrios	GR	Prof. Yasar Pancar	TR
Prof. Marat Ibatov	KZ	Prof. Yuriy Kuznetsov	UA
Prof. Marco Bocciolone	IT	Prof. Wei Hua Ho	ZA

CONTENTS

MACHINES

ADVANCED CONDUCTOR SHAPE TECHNOLOGY

PhD, P. Eng. Pushev G., Chief Assistant Velev S., Prof. Dulgerov N. 3

THEORY OF PRECISION MECHANIC PANEL SCREWS

M.Sc. Lázár T., Dr Nagy J. PhD. 8

TECHNOLOGIES

OPTIMISING TECHNOLOGY FOR PRODUCTION OF HIGH FREQUENCY WELDED PIPES MADE OF X60 STEEL

Prof. Cvetkovski S. PhD., Dr. Brkovski D. PhD. 12

ONTOLOGY-BASED DATA ACCESS AND MODEL TRANSFORMATIONS FOR ENTERPRISE INTEROPERABILITY

Assist. Prof. Dr. Gocheva D. G., Prof. Dr. Batchkova I. A., Prof. D.Sc. Popov G. T. 16

A MAPREDUCE SOLUTION FOR HANDLING LARGE DATA EFFICIENTLY

M.Sc. K. Al-Barznji PhD Student, Assoc. Prof. Dr. A. Atanasov 20

ADVANCED CREATING OF 3D DENTAL MODELS IN BLENDER SOFTWARE

Phd Tihomir Dovramadjiev 24

PHASE TRANSITION – MATHEMATICS AND MATHEMATICAL PHYSICS IN MICRO-FOUNDRY

St. Bushev PhD. assoc. prof. eng. 26

LOCAL POST WELD HEAT TREATMENT OF WELDED STEEL PIPES

Prof. Dr. Maksuti Rr. 30

FRACTOGRAPHIC ANALYSIS OF WELDED JOINT SURFACES

Prof. Dr.Maksuti Rr. 34

MATERIALS

COMPARATIVE ANALYSIS OF STATIC AND DYNAMIC ELASTIC MODULUS OF POLYMER CONCRETE COMPOSITES

Assoc. Prof. Eng. Popov I. PhD., M.Sc. Sabev S. 38

GRANULATED FOAM GLASS. PRODUCTION, PHYSICAL AND MECHANICAL PROPERTIES

Sen. Res. Eng. Marinov M., Assoc. Prof. Dr. Lakov L, Ph. D. Eng. Kr. Toncheva 42

A COMPARISON OF FRICTION CHARACTERISTICS OF VARIOUS SURFACE TREATED HOT WORK TOOL STEEL

Phd Student Tutar M., Prof. Dr. Bayram A. 45

NEW IRON OXIDES/HYDROXIDES BIOMATERIALS FOR APPLICATION IN ELECTRONICS AND MEDICINE

Prof. Nedkov I. , Prof. Groudeva V., M.Sc. Angelova R., PhD Iliev M., PhD Slavov L. 48

EFFECT OF METAL PHASE COMPOSITION ON MECHANICAL AND TRIBOLOGICAL PROPERTIES OF Fe-GLASS COMPOSITES

Prof., Dr. Sc. Bagliuk G.A., Eng. Kuruvskyi V., Eng. Kostenko O. 52

COMPARATIVE STUDY OF TRIBOCORROSION PROPERTIES OF SOME BIOBASED MATERIALS IN SIMULATED ARTIFICIAL SALIVA

Assoc.Prof. Dr. H. Mindivan 58

TRIBO-CORROSION BEHAVIOR OF CAST AND SELECTIVE LASER MELTED Co-Cr ALLOY FOR DENTAL APPLICATIONS

Assist. Prof. Ş. Hakan Atapek, Assoc. Prof. Tsanka Dikova, MSc. Gülşah Aktaş, Assoc. Prof. Şeyda Polat, Assist. Prof. Dzhendo Dzhendov, Diana Pavlova, Assist. Prof. Maksim Simov 61

OBTAINING OF GAS-TIGHT GLASS-CERAMIC JOINTS OF MULLITE ARTICLES THROUGH THE NANOCRYSTALLIZATION OF Y₂O₃-Al₂O₃-SiO₂ GLASS

Dr. Danilenko I., M.Sc. Akhkozov L., Prof. Dr. Sci. Konstantinova T., Dr. Doroshkevich A. 65