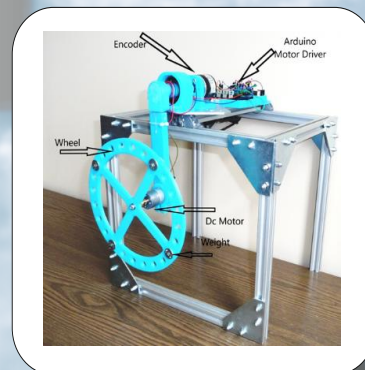


International journal
for science, technics and
innovations for the industry



MACHINES
TECHNOLOGIES
MATERIALS

YEAR XIV **Issue 5 / 2020** **ISSN PRINT 1313-0226**
ISSN WEB 1314-507X



Published by
Scientific technical
Union of Mechanical Engineering



MACHINES. TECHNOLOGIES. MATERIALS

INTERNATIONAL SCIENTIFIC JOURNAL

ISSN PRINT 1313-0226, ISSN WEB 1314-507X, YEAR XIV, ISSUE 5 / 2020

INTERNATIONAL EDITORIAL BOARD

EDITOR IN CHIEF:

Georgi Popov

Technical University of Sofia

BG

MEMBERS:

Abdrakhman Naizabekov

Rudny industrial institute

KZ

Ahmet H. Ertas

Bursa Technical University

TR

Albert Albers

Karlsruhe Institut of Technology

DE

Andrzej Golabczak

Lodz University of Technology

PL

Andrzej Huczko

Warsaw University

PL

Dimitar Karaivanov

University of Chemical Technology and Metallurgy, Sofia

BG

Emilia Abadjieva

Akita University

JP

Erdem Camurlu

Akdeniz University, Antalya

TR

Eugen Sheregii

University of Rzeszow

PL

Franz Haas

Graz University of Technology

AT

Galina Nicolcheva

Technical University of Sofia

BG

Gennadii Bagliuk

Institute for Problems of Materials Science NAS of Ukraine, Kiev

UA

Georgii Raab

Ufa State Aviation Technical University

RU

Gregory Gurevich

Shamoon College of Engineering, Ashdod

IL

Hiroyuki Moriyama

Tokai University, Hiratsuka

JP

Idilia Batchkova

University of Chemical Technology and Metallurgy, Sofia

BG

Ivan Kralov

Technical University of Sofia

BG

Ivan Kuric

University of Zilina

SK

Julieta Kaleicheva

Technical University of Sofia

BG

Katia Vutova

Institute of Electronics, Bulgarian Academy of Sciences

BG

Maria Nikolova

Angel Kanchev University of Ruse

BG

Natasa Naprstkova

Jan Evangelista Purkyne University in Usti nad Labem

CZ

Oana Dodun

Gheorghe Asachi Technical University of Iasi

RO

Ognyan Andreev

Technical University of Sofia

BG

Predrag Dasic

High Technical Mechanical School of Trstenik

RS

Rasa Kandrotaitė

Kaunas University of Technology

LT

Raul Turmanidze

Georgian Technical University, Tbilisi

GE

Roumen Petrov

Ghent University

BE

Sergey Dobatkin

National University of Science and Technology "MISIS", Moscow

RU

Souren Mitra

Jadavpur University, Kolkata

IN

Svetlana Gubenko

National Metallurgical Academy of Ukraine, Dnipro

UA

Vedran Mrzljak

University of Rijeka

HR

Wu Kaiming

Wuhan University of Science and Technology

CN

TECHNICAL EDITORS:

M. Sc. Eng Radoslav Daskalov, M. Sc. Eng Oleg Mihailov

Scientific and technical union of mechanical engineering
108 R. S. Rakovski str., Sofia, Bulgaria
www.stumejournals.com, office@stumejournals.com

CONTENTS

MACHINES

Dynamic analysis of a four-bar linkage mechanism Mustafa Arda	186
Effect of Weight and Diameter Variables on Balance Process for Inertia Wheel Pendulum by Using Swing Up and PID Controller Eray Yılmazlar, Hilmi Kuşçu	191

TECHNOLOGIES

Analysis of welding of aluminium alloy AA6082-T6 by TIG, MIG and FSW processes from technological and economic aspect Aleksandra Koprivica, Darko Bajić, Nikola Šibalić, Milan Vukčević	194
Determination of the parameters of the drying process of sodium bicarbonate in a pneumatic dryer Milica Josimovic, Slavica Prvulovic, Jasna Tolmac, Vesna Mihajlovic	199
Innovative design for repair of corrected industrial reinforced concrete structures of light soda silos - Solvay Sodi AD, Devnya Valeriy Naidenov, Tzvetan Georgiev	201
Regularities of influence of electron beam technology on heat resistance of optical elements in precision instrument-making Yatsenko Irina, Antonyuk Victor, Vashchenko Vyacheslav, Kyrychenko Oksana, Butenko Tatyana, Kolinko Sergei, Yatsenko Kateryna	206
Influence of technological parameters of FDM-print on the strength characteristics of samples of polyamide Aliaksandr Skaskevich, Ammar Sudan, Dzhendo Dzhendov	210
Use of virtual casting for optimization the density of complex geometric aluminum parts, casted in to 3D-printed sand foundry molds Roumen Batchvarov	213

MATERIALS

Steels with bainite structure for railway wheels Svetlana Gubenko	215
Properties of composites with nanodiamonds of detonation synthesis Evgenii Petrov	219