

International journal
for science, technics and
innovations for the industry

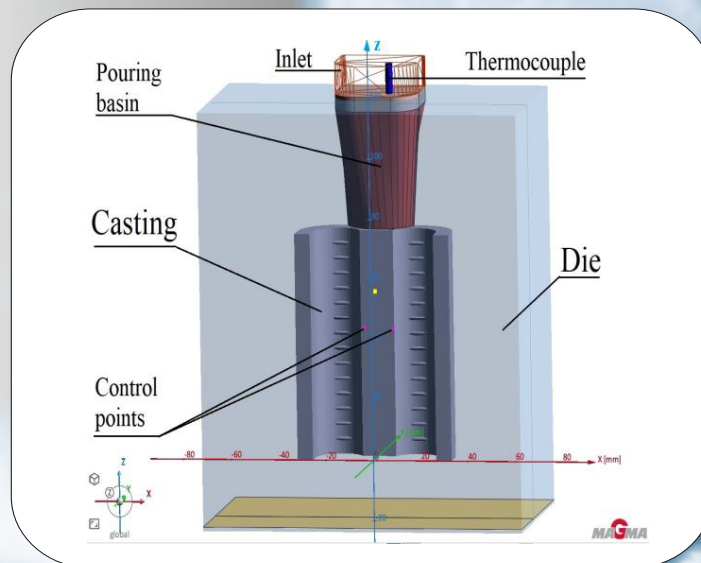


MACHINES
TECHNOLOGIES
MATERIALS

ISSN PRINT 1313-0226
ISSN WEB 1314-507X

Issue 5 / 2025

YEAR XIX



Published by
Scientific technical
Union of Mechanical Engineering



MACHINES. TECHNOLOGIES. MATERIALS

INTERNATIONAL SCIENTIFIC JOURNAL

ISSN PRINT 1313-0226, ISSN WEB 1314-507X, YEAR XIX, ISSUE 5 / 2025

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

Dimitar Karaivanov

University of Chemical Technology and Metallurgy, Sofia

BG

Dobre Runchev

Ss. Cyril and Methodius University in Skopje

NM

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

Iryna Charniak

National Academy of Science, Belarus

BY

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

All articles are published after peer review by two independent reviewers.

Scientific and technical union of mechanical engineering

108 R. S. Rakovski str., Sofia, Bulgaria

www.stumejournals.com, office@stumejournals.com

CONTENTS

MACHINES

Thermodynamic evaluation of a 250 mw three-cylinder steam turbine from ccpp Mrzljak Vedran, Anđelić Nikola, Poljak Igor, Prpić-Oršić Jasna	163
--	-----

TECHNOLOGIES

The new features in magmasoft for optimization and improvement the casting technologies Georgi Evt. Georgiev	167
Simulation of gravity filling a metal mold with aluminum alloy (EN AC-46400 AlSi9Cu1Mg) Krum Petrov	172
A method for correcting the systematic error of thermocouple readings Georgi Evt. Georgiev	175
A mathematical model of the movement of a gas bubble in a viscous liquid Georgi Evt. Georgiev	179

MATERIALS

Effect of laser machining on the change of the microstructure of the surface layer of AlSi11 alloy castings Jaroslaw Piatkowski, Tomasz Matula, Leszek Chowaniec	184
Investigation of the thermal properties of X155CrVMo12-1 steel after quenching and tempering Uroš Stamenković, Ivana Marković, Srba Mladenović, Dragan Manasijević, Milan Nedeljković, Petar Milanović	188
Influence of iron and manganese on the microstructure and mechanical properties of AlSi9Cu3(Fe) alloy castings Jaroslaw Piatkowski, Tomasz Matula, Leszek Chowaniec	191
Mechanoactivated silicatecontaining modifiers for thermoplastic polymers Tatyana Povshok, Yauheniya Eismont, Tatyana Grigorieva, Alexander P. Voznyakovsky, Alexander A. Voznyakovsky, Yauheni Auchynnika	195