

TECHNICAL UNIVERSITY OF CLUJ-NAPOCA
UNIVERSITATEA TEHNICĂ DIN CLUJ-NAPOCA

ACTA TECHNICA NAPOCENSIS

Series: Environmental Engineering and
Sustainable Development Entrepreneurship
EESDE

Seria: Ingineria Mediului și Antreprenoriatul
Dezvoltării Durabile
IMADD

Volume 4, Issue 4, October – December 2015
Volumul 4, Numărul 4, octombrie – decembrie 2015

ACTA TEHNICA NAPOCENSIS
Environmental Engineering and
Sustainable Development Entrepreneurship
EESDE

EDITORIAL BOARD

EDITOR-IN-CHIEF: Vasile Filip SOPORAN, Technical University of Cluj-Napoca, Romania

VICE EDITOR IN CHIEF: Viorel DAN, Technical University of Cluj-Napoca, Romania

ASOCIATE EDITOR: Alexandru OZUNU, Babes-Bolyai University of Cluj-Napoca, Romania

EDITORIAL ADVISORY BOARD:

Dorel BANABIC, Technical University of Cluj-Napoca, Romania, Member of the Romanian Academy
Vasile COZMA, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania,
Member of Romanian Agricultural and Forestry Sciences Academy
Avram NICOLAE, Polytechnic University of Bucharest, Romania
Vasile PUȘCAȘ, Babeș-Bolyai University of Cluj-Napoca, Romania
Tiberiu RUSU, Technical University of Cluj-Napoca, Romania
Carmen TEODOSIU, "Gheorghe Asachi" Technical University of Iași, Romania
Ioan VIDA-SIMITI, Technical University of Cluj-Napoca, Romania

INTERNATIONAL EDITORIAL ADVISORY BOARD:

Monique CASTILLO, University Paris XII Val-de-Marne, France
Lucian DĂSCĂLESCU, University of Poitiers, France
Diego FERREÑO BLANCO, University of Cantabria, Spain
Luciano LAGAMBA, President of Emigrant Immigrant Union, Roma, Italy

EDITORIAL STAFF:

Ovidiu NEMEȘ, Technical University of Cluj-Napoca, Romania
Timea GABOR, Technical University of Cluj-Napoca, Romania
Bianca Michaela SOPORAN, Technical University of Cluj-Napoca, Romania

ENGLISH LANGUAGE TRANSLATION AND REVIEW:

Sanda PĂDUREȚU, Technical University of Cluj-Napoca, Romania

DESKTOP PUBLISHING:

Timea GABOR, Technical University of Cluj-Napoca, Romania

WEBMASTER:

Andrei Tudor RUSU, Technical University of Cluj-Napoca, Romania
Doina Ștefania COSTEA, Technical University of Cluj-Napoca, Romania

EDITORIAL CONSULTANT:

Călin CĂMPEAN, Technical University of Cluj-Napoca, Romania

U.T.PRESS PUBLISHING HOUSE CLUJ-NAPOCA

EDITORIAL OFFICE:

Technical University of Cluj-Napoca, Faculty of Materials and Environmental Engineering,
Department of Environmental Engineering and Sustainable Development Entrepreneurship
Center for Promoting Entrepreneurship in Sustainable Development,
103-105, Muncii Boulevard, 400641, Cluj-Napoca, Romania
Phone: +40 264/202793, Fax: +40 264/202793
Home page: <http://imadd.utcluj.ro/eesde/welcome.html>
E-mail: eesde@imadd.utcluj.ro

ISSN – 2284-743X; ISSN-L – 2284-743X

SCIENTIFIC BOARD

Mihail ABRUDEAN – Technical University of Cluj-Napoca, Romania;
Emanuel BABICI – Vice-Charmain S.C. Uzinsider SA, Bucharest, Romania;
Grigore BABOIANU – Administration of Biosphere Reserve of the Danube Delta, Tulcea, Romania;
Simion BELEA – Technological Information Center, North University Center of Baia-Mare, Romania;
Petru BERCE – Technical University of Cluj-Napoca, Romania;
Marius BOJIȚĂ – "Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania;
Nicolae BURNETE – Technical University of Cluj-Napoca, Romania;
Viorel CÂNDEA – Technical University of Cluj-Napoca, Romania;
Melania Gabriela CIOT – Babeș-Bolyai University of Cluj-Napoca, Romania;
Virgil CIOMOȘ – Babeș-Bolyai University of Cluj-Napoca, Romania;
Aurel CODOBAN – Babeș-Bolyai University of Cluj-Napoca, Romania, Romania;
Tamás CSOKNYAI – University of Debrecen, Hungary;
Ioan CUZMAN – "Vasile Goldis" Western University of Arad, Romania;
Viorel DAN – Technical University of Cluj-Napoca, Romania;
Petru DUNCA – North University Center of Baia-Mare, Romania;
Ucu Mihai FAUR – "Dimitrie Cantemir" Christian University of Cluj-Napoca, Romania;
Maria GAVRILESCU - "Gheorghe Asachi" Technical University of Iași, Romania;
Ion Cosmin GRUESCU – Lille University of Science and Technology, Lille, France;
Ionel HAIDUC – Babeș-Bolyai University of Cluj-Napoca, Romania, President of Romanian Academy;
Speranța Maria IANCULESCU – Technical University of Civil Engineering, Bucharest, Romania;
Petru ILEA – Babeș-Bolyai University of Cluj-Napoca, Romania;
Ioan JELEV – Polytechnic University of Bucharest, Romania, Member of Romanian Agricultural and Forestry Sciences Academy;
Johann KÖCHER – Dr Köcher GmbH, Fulda, Germany;
Frédéric LACHAUD – University Toulouse, France;
Sanda Andrada MĂICĂNEANU – Babeș-Bolyai University of Cluj-Napoca, Romania;
Jean Luc MENET – Université de Valenciennes et du Hainaut Cambrésis, France;
Valer MICLE – Technical University of Cluj-Napoca, Romania;
Mircea MOCIRAN – Technical University of Cluj-Napoca, Romania;
Radu MUNTEANU – Technical University of Cluj-Napoca, Romania, Member of Romanian Technical Sciences Academy;
Emil NAGY – Technical University of Cluj-Napoca, Romania;
Ovidiu NEMEȘ – Technical University of Cluj-Napoca, Romania;
Dumitru ONOSE – Technical University of Civil Engineering Bucharest, Romania;
Vasile OROS – North University Center of Baia-Mare, Romania;
Alexandru OZUNU – Babeș-Bolyai University of Cluj-Napoca, Romania;
Fesneau PASCAL – Honorary Consul of France in Cluj-Napoca, Romania;
Marian PROOROCU – University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania;
Daniela ROȘCA – University of Craiova, Romania;
Adrian SAMUILĂ – Technical University of Cluj-Napoca, Romania;
Cornel SOMEȘAN – Association for Development and Promotion Entrepreneurship, Cluj-Napoca, Romania;
Vasile Filip SOPORAN – Technical University of Cluj-Napoca, Romania;
Alexandru TULAI – Iquest Technologies Cluj-Napoca, Romania;
Horățiu VERMEȘAN – Technical University of Cluj-Napoca, Romania;
Nicolas Duilliu ZAMFIRESCO – DZ Consulting International Group, Paris, France.

ACTA TEHNICA NAPOCENSIS, *Series: Environmental Engineering and Sustainable Development Entrepreneurship* is indexed in:

- **Google Scholar**
- **Scientific Indexing Services**
- **Research Bible**

ACTA TEHNICA NAPOCENSIS

Scientific Journal of Technical University of Cluj-Napoca

Series: Environmental Engineering and Sustainable Development Entrepreneurship (EESDE)

Series published by Center for Promoting Entrepreneurship in Sustainable Development

Founding director of the series EESDE: professor Vasile Filip SOPORAN, Ph.D.

Quarterly: Vol. 4 - Issue 4 (October – December 2015)

ISSN – 2284-743X; ISSN-L – 2284-743X

Objectives and purpose: The scientific journal “Environmental Engineering and Sustainable Development Entrepreneurship” is an interdisciplinary publication that seeks scientific analysis in order to achieve debates on environmental engineering and sustainable development entrepreneurship on local, national or global level. Specifically, under the auspices of entrepreneurship and sustainable development, the magazine will include scientific contributions in the fields of environmental engineering and the management of enterprise and entrepreneurship, showing trends and challenges in the XXI century on the sustainable development and environmental engineering issues. Contributions will offer to the readers, original and high quality materials.

Readers: The scientific journal is designed to provide a source of scientific references to reach any person which has the research activity in the field of global issues on environment and sustainable entrepreneurship. The journal offers to teachers, researchers, managers, professionals, entrepreneurs, civil society and political personalities, a tool to develop such a sustainable business, which protects the environment.

Content: The scientific journal publish original papers, reviews, conceptual papers, notes, comments and novelties.

Areas of interest: The main theme and objective of the scientific journal is environmental engineering and sustainable development entrepreneurship; being no limit to articles which will be considered by the editorial board.

- ❖ Industrial Engineering
 - ❖ Technologies and Equipment for Industrial Environmental Protection
 - ❖ Industrial Engineering and Environment
 - ❖ Materials Science and Engineering
 - ❖ Entrepreneurship in Sustainable Development
 - ❖ Eco Responsible Entrepreneurship
 - ❖ Social Entrepreneurship, etc.
-

Obiective și scop: Revista științifică „Ingineria Mediului și Antreprenoriatul Dezvoltării Durabile” este o publicație interdisciplinară care urmărește o analiză științifică în scopul realizării unor dezbateri asupra ingineriei mediului și antreprenoriatul dezvoltării durabile pe plan local, național sau mondial. La nivel concret sub auspiciile antreprenoriatului și dezvoltării durabile revista va include contribuții științifice din domeniile ingineriei mediului, managementul întreprinderii și antreprenoriatului, prezentând tendințele și provocările secolului XXI în problematica dezvoltării durabile și protecției mediului. Contribuțiile vor avea scopul de a oferi cititorilor materiale originale și de înaltă calitate.

Cititori: Revista științifică este elaborată pentru a oferi o sursă de referințe științifice la îndemâna oricărei persoane care are activitatea de cercetare în domeniul problemelor globale cu privire la protecția mediului, antreprenoriat sau dezvoltarea durabilă. Revista oferă cadrelor didactice universitare, cercetătorilor, managerilor, profesioniștilor, antreprenorilor, reprezentanților ai societății civile și personalităților din politică, un instrument de lucru pentru a dezvolta astfel o afacere durabilă protejând mediul înconjurător.

Conținut: Revista științifică publică lucrări originale, recenzii, lucrări conceptuale, note, comentarii și noutăți.

Domenii de interes: Tema principală și obiectivele revistei științifice sunt ingineria mediului, antreprenoriatul și dezvoltarea durabilă, însă nu există nici o limitare la articolele care vor fi luate în considerare de către comitetul științific al revistei.

- ❖ Inginerie industrială
 - ❖ Tehnologii și echipamente pentru protecția mediului industrial
 - ❖ Ingineria și protecția mediului industrial
 - ❖ Știința și ingineria materialelor
 - ❖ Antreprenoriat în domeniul dezvoltării durabile
 - ❖ Antreprenoriat ecoresponsabil
 - ❖ Antreprenoriat social, etc.
-

CONTENT

CUPRINS

EDITORIAL – DEVELOPMENT AND ENGINEERING THINKING THROUGH MODELS

EDITORIAL – DEZVOLTAREA ȘI GÂNDIREA INGINEREASCĂ PRIN MODELE

Vasile Filip SOPORAN..... 7

THE EFFECT OF SILANIZED SiO₂ NANOPARTICLES ON THE HYDRATION OF PORTLAND CEMENT PASTE

STUDIUL EFECTELOR NANOPARTICULELOR DE SiO₂ SILANIZATE ASUPRA HIDRATĂRII PASTEI DE CIMENT PORTLAND

Andrea BEDE, Alexandra POP, Marioara MOLDOVAN, Ioan ARDELEAN..... 13

ECOLOGICAL RESTORATION OF FORMER INDUSTRIAL SITES FROM ENTREPRENEURIAL PERSPECTIVE

RECONSTRUCȚIA ECOLOGICĂ A ZONELOR INDUSTRIALE DEZAFECTATE DIN PERSPECTIVA ANTREPRENORIALĂ

Melania-Nicoleta BOROȘ, Valer MICLE, George-Călin ROGOZAN..... 19

THE SUBSTANTIATION PERSPECTIVE OF DEVELOPING CIRCULAR ECONOMY OF INSTITUTIONAL TERMINOLOGY ON WASTE MANAGEMENT

FUNDAMENTAREA ECONOMIEI CIRCULARE DIN PERSPECTIVA EVOLUȚIEI TERMINOLOGICE INSTITUȚIONALE CU PRIVIRE LA GESTIUNEA DEȘEURILOR

Vasile Filip SOPORAN, Alin Lenuț POP, Marius Dan CRIȘAN..... 25

EXPERIMENTAL RESEARCH ON DETERMINING THE PRESSURES EVOLUTION IN MONOPHASIC SONIC-SYSTEMS – WITHOUT BALANCING OF PHASES, AT IDLE.

CERCETĂRI EXPERIMENTALE CU PRIVIRE LA DETERMINAREA EVOLUȚIEI PRESIUNILOR ÎN SISTEMELE SONICE MONOFAZICE – FĂRĂ ECHILIBRAREA FAZELOR, LA MERS ÎN GOL.

Ioana DENES-POP..... 41

CONSIDERATIONS ON ENTREPRENEURIAL PLATFORM IN MATERIALS ENGINEERING

CONSIDERAȚII ASUPRA PLATFORMEI ANTREPRENORIALE LA NIVELUL INGINERIEI MATERIALELOR

Mihail-Marius VESCAN, Timea GABOR..... 51

STUDY ON THE BIOLEACHING INFLUENCE FACTORS

STUDIUL ASUPRA FACTORILOR DE INFLUENȚĂ AI BIOLIXIVIERII

Ioana Monica SUR..... 61

INFORMATIONS – The Conference on “Entrepreneurship, Business Environment and Sustainable Development” Cluj-Napoca, November 19th – 20th, 2015

INFORMAȚII – Conferința Antreprenoriat, “Mediu de Afaceri și Dezvoltare Durabilă” Cluj-Napoca, 19 - 20 noiembrie 2015

Ancuța Elena TIUC..... 69

INDEX – Journal Acta Tehnica Napocensis, Series Environmental Engineering And Sustainable Development Entrepreneurship, Volume 4, Issues 1 – 4

INDEX – Revista Acta Tehnica Napocensis, Seria Ingineria Mediului și Antreprenoriatul Dezvoltării Durabile, Volumul 4, Numerele 1 – 4

Timea GABOR..... 75