


BUILDING MATERIALS RESEARCH GROUP

Contact details

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Acronym	BURG
Logo	
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Areas of expertise

Civil engineering

- green building materials;
- quality control of building materials;
- recovery of industrial waste in construction materials;
- influence of construction materials on health and environment;
- „In situ” determination of mechanical strengths by non-destructive methods.

Team and key skills

Prof. Dr. Eng. Daniela Lucia MANEA – graduated in 1988 the Faculty of Civil Engineering Cluj-Napoca, Phd. eng. since 1998. Her research interests focus on: recovery of industrial waste in construction materials; national policy for sustainable development in the construction industry; composite materials in construction materials; influence of construction materials on health and environment. (coordinator of the building materials laboratory).

Assoc. Prof. Dr. Eng. Claudiu ACIU – graduated in 2002 the Faculty of Civil Engineering Cluj-Napoca, Phd. eng. since 2009. His research interests focus on: green building materials; reuse of different types of waste in the composition of new construction materials; influence of construction materials on health and environment; optimizing the choice of sustainable building materials by multicriteria analysis.

Assist. Dr. Eng. Florin BABOTA – graduated in 1992 the Faculty of Civil Engineering Cluj-Napoca, Phd. eng. since 2009. His research interests focus on: energy efficiency in buildings; low-energy house; home energy audit; thermal insulation materials; innovative building materials.

Assist. Dr. Eng. Luminița Monica MOLNAR – graduated in 2009 the Faculty of Civil Engineering Cluj-Napoca, Phd. eng. since 2012. Her research interests focus on: ecological mortars; micro and macroscopic study of mortars realized with wastes; special mortars for sustainable development; development of new building materials with low impact on the environment.

Assist. Dr. Eng. Răzvan Andrei IERNUȚAN – graduated in 2000 the Faculty of Civil Engineering Cluj-Napoca, Phd. eng. since 2015. His research interests focus on: rehabilitation and consolidation of masonry buildings situated in seismic areas; ► design of sustainable buildings; composite material reinforcements, reinforcement systems.

Assist. Dr. Eng. Elena JUMATE – graduated in 2005 the Faculty of Civil Engineering Cluj-Napoca, Phd. eng. since 2014. Her research interests focus on: composite construction materials; modern methods of investigation on mortars (X-ray Diffraction (XRD), Scanning Electron Microscopy (SEM) and Nuclear Magnetic Resonance (NMR)).

Phd Students: Eng. Raluca FERNEA; Eng. Ioan Olimpiu MIRON; Eng. Andrei MUSTEA; Eng. Yvette ORBAN; Eng. Cornel BOTOROAGA; Eng. Iacob FLOREA. Their research activity focuses on different subjects in the building materials area.

Infrastructure

The Central Laboratory of the Faculty of Civil Engineering is accredited with 1st Grade Level, is properly equipped and has qualified personnel. The laboratory equipment is comprised of:

►laboratory glassware; ►weighing scales; ►set of sieves and screens; ►electromagnetic screening device; ►automatic vibrating table; ►flow table; ►metal moulds; ►cylindrical patterns; ►paddle mixers; ►250 KN hydraulic press; ►automatic flexural tensile tester; ►mechanical and digital sclerometer; ►Pull-off tester "58-C0215/T"; ►device for determining the density of cement; ►Vicat device; ►Blaine permeability apparatus; ►Micro-Deval device; ►test samples casting moulds; ►samples storage tanks; ►220l oven; ►climate-controlled room for storing testing samples; ►Heat Flow Meter "FOX 200".

Development strategy

The research and development activities of the research group are focused on:

- contracts with third parties, research in the fields of building materials;
- publishing articles in national and international journals, with BDI and ISI scores;
- participating in conferences, products presentations or technology development in the field of Civil Engineering.

Representative projects

"Structure-dynamics-properties relationships and aging effects in nanocomposite elastomers and proton exchange membranes" (2012 – 2015) – Project PNII – Idei No. 307/2011, project funded by UEFISCDI.

"Photocatalytic concrete – Future solution to combat air pollution" (2013) – Internal competition for research/ Development/ Innovation – Project 24273/2013, Technical University of Cluj-Napoca. Faculty of Construction.

"Innovative Ecological Materials in Construction: A Multicriteria Analysis for Optimizing the Choice of Sustainable Building Materials in the Context of Sustainable Development" (2014 – 2015) – Post-Doctoral Programme POSDRU/159/1.5/S/137516, project co-funded from European Social Fund through the Human Resources Sectorial Operational Program 2007-2013.

"Calculation of bearing capacity of self-supporting sandwich panels with both sides of sheet metal" (2016 – 2017) – Technological service contract No. 689/ 18.03.2016 for company Marcegaglia România SRL.

Significant results

1. Jumate, E.; Moldovan, D.; Fehete, R. and D. Manea. NMR Relaxometry Study of Plaster Mortar with Polymer Additives. Conference: 9th International Conference on Processes in Isotopes and Molecules (PIM) Location: Cluj Napoca, ROMANIA Date: SEP 25-27, 2013. PROCESSES IN ISOTOPES AND MOLECULES (PIM 2013) Book Series: AIP Conference Proceedings Volume:1565 Pages: 112-116. ISBN: 978-0-7354-1193-7.
2. Claudiu Aciu, Daniela Lucia Manea, Cosmin Strilechi (2015). The Eccomat Program for the Selection of Ecological Materials in Order to Ensure a Healthy Built Environment. *Procedia Technology* 19(2015): 490–497, DOI: 10.1016/j.protcy.2015.02.070, ISSN: 2212-0173.
3. Claudiu Aciu, Daniela Lucia Manea, Luminita Monica Molnar, Elena Jumate (2015). Recycling of Polystyrene Waste in the Composition of Ecological Mortars. *Procedia Technology* 19(2015):498–505, DOI: 10.1016/j.protcy.2015.02.071, ISSN: 2212-0173.
4. Elena Jumate, Daniela Lucia Manea, Claudiu Aciu, Luminita Molnar, Radu Fehete (2015). Innovative Materials Made by Adding Cellulose Ethers to Cement Mortars. *Procedia Technology* 19(2015): 291–298, DOI: 10.1016/j.protcy.2015.02.042, ISSN: 2212-0173.
5. Luminita Monica Molnar, Daniela Lucia Manea, Claudiu Aciu, Elena Jumate (2015). Innovative Plastering Mortars Based on Recycled Waste Glass. *Procedia Technology* 19(2015): 299–306, DOI: 10.1016/j.protcy.2015.02.043, ISSN: 2212-0173.
6. Claudiu Aciu, Daniela Lucia Manea, Carmen Puia, Oana Cadar (2015). Mortars for the Enhancement of the Indoor Environmental Quality, *STUDIA UBB CHEMIA, LX, 4/2015:45 – 54*, ISSN 1224-7154.
7. Dana Maria Cantor (Andreş), Daniela Lucia Manea (2015). Innovative building materials using agricultural waste. *Procedia Technology* 19(2015): 456–462, DOI: 10.1016/j.protcy.2015.02.065, ISSN: 2212-0173.
8. Muntean, L. E.; Manea, D. L.; Cosma, C. The Effects of Exposure of the Human Body to RADON. Integrated Measurements Performed in Alba County, Romania. *International Conference On Advancements Of Medicine And Health Care Through Technology*, Book Series: IFMBE Proceedings, Volume 36 Pages 110-113.
9. Simina, Marius; Molnar, Luminita; Manea, Daniela; Ioan Ardelean. Monitoring the Air Influence on Cement-Lime Mortar Hydration Using Low-Field Nuclear Magnetic Resonance Relaxometry. *Applied Magnetic Resonance*, Volume: 43 Issue: 3 Pages: 443-450, ISSN 1613-7507.
10. Muntean, Lavinia Elena; Manea, Daniela Lucia; Cosma, Constantin. The Radioactivity Levels In Various Plastering Mortars Made With River Aggregates From The Alba County. *Romanian Journal Of Materials*, 42(1):30-36.
11. Ierănuțan R. A. (2014). Comparative stress - Specific deformation relationship for AAC masonry and aac confined masonry with disperse reinforced concrete pylons. *Journal of Applied Engineering Sciences* VOL. 4(17):35-39. ISSN: 2247-3769.

The offer addressed to the economic environment

Research & development in core areas	Fundamental domain Civil Engineering – modern techniques and methods used in building materials quality control.
Research & development in applied fields	Green building materials. Recovery of industrial waste in construction materials. Influence of construction materials on health and environment.
Consulting	Quality control of building materials. Consultancy and applied research for the industrial or academic environment, according to the skills of the group members.
Applied engineering services	The Building Materials laboratory is part of the Central Laboratory of the Faculty of Civil Engineering and can issue quality certificates (test reports) for the authorized profiles. Tests on building materials (natural stone, aggregates, plaster, lime, cement, mortar, ceramic products, bitumen and bitumen impregnated materials etc.). Determination of the specific surface using Blaine permeameter. Determination of mechanical strengths of building materials (tensile, flexural and compressive strength) Observation of the behaviour of structures in real-time using non-destructive methods (surface mechanic methods and acoustic methods).
Training	Specialized courses in quality control of building materials. Training courses in the field of special rehabilitation materials.



Fig. 1 Building Materials Laboratory

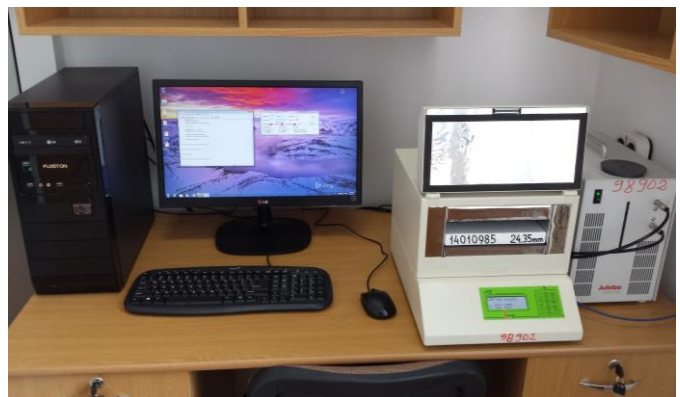


Fig. 2 Heat Flow Meter "FOX 200"



Fig. 3 Pull-off tester



Fig. 4 Hydraulic press