

GEOSUMAT Publications

Scientific articles:

1. Drabczyk A, Kudłacik-Kramarczyk S, Korniejenko K, Figiela B, Furtos G. "Review of Geopolymer Nanocomposites: Novel Materials for Sustainable Development" *Materials* 2023, 16(9), 3478; <https://doi.org/10.3390/ma16093478>.
2. Kirgiz MS, Mirza J, Cuc S, Prodan D, Saroși C, Perhaită I, Carpa R, Moldovan M, Popa D, Varvara S, Popa M. "Physico-antibacterial feature and SEM morphology of bio-hydraulic lime mortars incorporating nano graphene oxide and binary combination of nano graphene oxide with nano silver, fly ash, zinc, and titanium powders" *Buildings* 2023, 13(1), 172; <https://doi.org/10.3390/buildings13010172>.
3. Hotěk P, Fiala L, Lin W-T, Chang Y-H, Černý R. "Alkali-Activated Metashale Mortar with Waste Cementitious Aggregate: Material Characterization" *Material Proceedings* 2023, 13, 41; <https://doi.org/10.3390/materproc2023013041>.
4. Mildner M, Fořt J, Černý R. "Fiber-Reinforced Alkali-Activated Materials Based on Waste Materials" *Material Proceedings* 2023, 13, 1; <https://doi.org/10.3390/materproc2023013001>.
5. Duży P, Colombel MC, Hager I, Amiri O. "The Effect of Preconditioning Temperature on Gas Permeability of Alkali-Activated Concretes" *Materials* 2023, 16, 4143. <https://doi.org/10.3390/ma16114143>.
6. Furtos G*, Prodan D, Sarosi C, Moldovan M, Łach M, Melnychuk M, Korniejenko K*. Advanced Geopolymer Composites based Nanoparticles with Antimicrobial Activity Review. *Materials* 2023 16(23):7414. doi:10.3390/ma16237414.
7. Ortega-Nieto C, Losada-García N, Prodan D, Furtos G*, Palomo JM. "Recent advances on the design and applications of antimicrobial materials" *Nanomaterials* 2023, 13(17), 2406; <https://doi.org/10.3390/nano13172406>.
8. Shmlls M, Abed M, Fořt J, Horvath T, Bozsaky D. "Towards closed-loop concrete recycling: Life cycle assessment and multi-criteria analysis" *Journal of Cleaner Production* 410 (2023) 137179; <https://doi.org/10.1016/j.jclepro.2023.137179>.
9. Fořt J, Mildner M, Keppert M, Pommer V, Černý R. "Experimental and Environmental Analysis of High-Strength Geopolymer Based on Waste Bricks and Blast Furnace Slag" *Polymers* 2023, 15(14), 3092; <https://doi.org/10.3390/polym15143092>.
10. Bąk A, Bazan P, Pławecka K, Łach M. "Geopolymers based on fly ash from the Bełchatów power plant" *Materials Proceedings* 2023, 13(1):17. <https://doi.org/10.3390/materproc2023013017>.
11. Łach M, Kozub B, Bednarz S, Bąk A, Melnychuk M, Masłoń A. "The Influence of the Addition of Basalt Powder on the Properties of Foamed Geopolymers" *Materials* 2024, 17, 2336. <https://doi.org/10.3390/ma17102336>.
12. Furtos G, Prodan D, Sarosi C, Moldovan M, Korniejenko K, Miller L, Fiala L, Iveta N. "Mechanical Properties of MiniBars™ Basalt Fiber-Reinforced Geopolymer Composites" *Materials* 2024 17(1):248. doi:10.3390/ma17010248.
13. Fořt J, Mildner M, Černý R. "Consequences of omitting some important factors in the environmental analyses of commercial sodium silicate/sodium hydroxide use for alkaline activation in the light of comparison with cement-based composites". *The Science of the Total Environment* 2024, 928. doi:10.1016/j.scitotenv.2024.172324.
14. Kekez S, Novakova I, Lach M, Setlak K, Fiala L, Přikryl J, Furtos G, Petean I, Alexandersson KF, Baronins J, Hager I. "Waste Valorization for Fabrication of Geopolymers" *Case Studies in Construction Materials*. <https://doi.org/10.1016/j.cscm.2025.e04388>.
15. Furtos G, Sarosi C, Moldovan M, Korniejenko K, Łach M, Ungureanu V, Miller L, Nováková I. The influence of Alkali-Resistant MiniBars™ on the Mechanical Properties of Geopolymer Composites. *Materials* 2025, 18(4), 778; <https://doi.org/10.3390/ma18040778>.
16. Łach, M., Przybek, A., Setlak, K., Bazan, P. E., & Hebdowska-Krupa, M. Resistance of low-emission geopolymer binders with fibers to aggressive external factors. *Structure and Environment* 2024, 16, 3. <https://doi.org/10.30540/sae-2024-012>

Oral presentations at international conferences:

1. Furtos G, Prodan D, Sarosi C, Moldovan M. "An overview industrial waste-based geopolymers in Romania" 20–23 March 2023, Narvik, Norway.
2. Furtos G, Prodan D, Sarosi C, Moldovan M, Korniejenco K. "The Fly-Ash Based Geopolymer Composites for Circular Economy" 25th International Conference on Materials, Methods & Technologie, 17-20 August 2023, Burgas, Bulgaria.
3. Bazan P, Plawecka K, Lach M. "The use of recycled waste from photovoltaic panels in geopolymer concretes", 6th International Conference on Environmental Sustainability and Climate Change "Current Research on Environmental Sustainability and Climate Change", August 2023, Philadelphia, USA.
4. Sitarz M, Zdeb T, Tracz T, Kekez S*, Hager I. "Investigation of adhesion between basalt minibars and geopolymer matrix" The 9th international conference "CIVIL ENGINEERING – SCIENCE AND PRACTICE" GNP March 2024, Kolašin, Montenegro.
5. Furtos G*, Prodan D, Sarosi C, Moldovan M, Korniejenco K, Miller L, Fiala L, Novakova I. "Mechanical Properties of MiniBars™ Basalt Fiber-Reinforced Geopolymer Composites for buildings applications" COST Action: CA21121 - European Network for the Mechanics of Matter at the Nano-Scale. 1-3 May 2024, Vienna, Austria.
6. Bazan P, Setlak K, Hebdowska-Krupa M, Lach M. Disposal of refuse derived fuel of low quality and calorific value in geopolymer matrices, Mechanics and Materials in Design M2D2024, 1-5 September 2024, Nagoya, Japan.
7. Setlak K, Przybek A, Bazan P, Lach M. Use of locally sourced waste materials as alkali activated binders based on diatomite dust, Mechanics and Materials in Design M2D2024, 1-5 September 2024, Nagoya, Japan.
8. Sitarz M, Zdeb T, Tracz T, Kekez S, Novakova I. "Adhesion of Polypropylene, Steel and Basalt Fibres to a Geopolymer Matrix" ACEX International Conference on Advanced Computational Engineering and Experimenting, ACEX2024, 1-5 July 2024, Barcelona, Spain.
9. Furtos G*, Prodan D, Sarosi C, Moldovan M, Korniejenco K, Miller L, Fiala L. "The influence of MiniBars™ AR Glass Fiber on Mechanical Properties of Geopolymer Composites" 25th International Conference on Materials, Methods & Technologie, 15-18 August 2024, Burgas, Bulgaria.
10. Hotěk P, Fiala L "Self-heating experiment of multifunctional geopolymer board based on metashale with graphite powder admixture" 22nd International Conference on Numerical Analysis and Applied Mathematics (ICNAAM 2024), 11-17 September 2024, Heraklion, Greece.
11. Łach M, Przybek A, Setlak K, Bazan P, Hebdowska-Krupa M. Resistance of low-emission geopolymer binders with fibers to aggressive external factors; XXIII Scientific and Technical Conference KONTRA 2024 – Durability of buildings and protection against corrosion; October 9-11 2024, Cedzyna, Poland
12. Łach M., GEOSUMAT - an international research project on the use of diatomite deposits for the production of innovative construction binders; XXXIII conference "Current events and prospects of mineral resources management" (in Polish), 6-8 November 2024, Krynica-Zdrój, Poland
13. Furtos G*, Sarosi C, Moldovan M, Korniejenco K, Łach M, Miller L, Novakova I. The influence of AR MiniBars™ on Mechanical Properties of Geopolymer Composites, Symposium on Microbiologically Influenced Corrosion (MIC) in Industrial and Utility Systems, 21-23 January 2025, Nicosia, Cyprus.
14. Łach M. Technologies limiting the use of primary raw materials - geopolymers as an element of the raw material transformation towards a circular economy, Mineral Resources & Energy Congress 2025, February 24-26 2025, Cracow, Poland.
15. Mróz K, Olbrych-Kmak M, Hager I. Carbonate aggregate in concrete exposed to high temperatures, 12th International Conference on Fracture Mechanics for Concrete and Concrete Structures, April 23-25, 2025, Vienna, Austria.

Poster presentations at international conferences:

1. Moldovan M, Sarosi C, Popa D, Prodan D, Popa M, Furtos G. "Geopolymers with graphene used for building materials" 25th International Conference on Materials, Methods & Technologie, 17-20 AUGUST 2023, Burgas, Bulgaria.
2. Bazan P, Plawecka K, Lach M. "Effect of manganese and zinc addition on the properties of geopolymers", 6th World Congress on Materials Science and Engineering "Materials Innovation and Impact" MATERIALS INFO 2023, September 2023, Rome, Italy.
3. Furtos G*, Sarosi C, Moldovan M, Korniejenko K, Łach M, Miller L, Novakova I. Advanced Geopolymer Composites Reinforced with MiniBars™, 3rd MecaNano General Meeting, 19-21 May 2025, Krakow, Poland.
4. Nováková I. "GEOSUMAT" in Dresden

Book chapters:

1. Duży P, Hager I, Colombel MC, Amiri O. "Correlation Between Chloride Ions' Migration and Diffusion Coefficients of Alkali-Activated Concrete" ed. A. Jędrzejewska et al. (Eds.): SynerCrete 2023, RILEM Bookseries 44, 1204–1216. https://doi.org/10.1007/978-3-031-33187-9_112.

Bachelor/Master/PhD theses:

1. Heyndrickx M-L, De Muynck D. "Analysis of Early-Age Properties of Geopolymers with Various Waste Materials" Master of Science dissertation, supervis. Iveta Nováková, Veerle Boel. 2023 Ghent University, Belgium.
2. Cabaj E. "Tests of Surfaces of Coloring Geopolymers in Different Environmental Conditions" Master of Science dissertation, supervis. Michał Łach. 2023 Cracow University of Technology, Poland
3. Eldrege Arenas G. P., "Optimization of Geopolymer Carbon sequestration materials using Amorphous Waste Materials: Using geothermal and aluminium waste to reduce carbon emissions in the construction industry". Master of Science dissertation, supervis. Sigrún Nanna Karlsdóttir, Kristján F. Alexandersson, Sunna Ó. Wallevik, Jan Prikryl. 2024. University of Iceland, Iceland.
4. Guzik N. "Testing the Possibility of Using Free Tools For Life Cycle Analysis of Geopolymer Materials on the Example of Open LCA Software" Master of Science dissertation, supervis. Michał Łach. 2024 Cracow University of Technology, Poland
5. Finik B. „Frost resistance of concrete with geopolymer matrix" Master of Science dissertation, supervis. Izabela Hager. 2025 Cracow University of Technology, Poland.
6. Pollentier C, Devriendt J. "Durability testing and characterisation of alkali activated materials with fibre reinforcement" Master of Science dissertation, supervis. Iveta Nováková, Veerle Boel, Ashfaq Ahmed Jhatial. 2025 Ghent University, Belgium.

Other dissemination activities:

1. Project website: https://en.uit.no/project/geosumat/nyheter/artikkel?sub_id=802914.
2. Geopolymer Sumer School at Cracow University of Technology, 5-16 July 2022, Poland.
3. Gerosion hosted the EU ambassador Lucie Samcova-Hall Allen at their facility in Reykjavik, Iceland.
4. 7th International Workshop on Concrete Spalling due to Fire Exposure, BAM, Berlin, Germany.
5. GEOSUMAT Seminar - 21st of March 2023 (online).
6. Icelandic Industrial Exhibition 2023 (Iðnaðarsýningin 2023).
7. 10th edition of MATBUD'2023 Scientific-Technical Conference at Cracow University of Technology, 19-21 April 2023, Cracow, Poland.
8. 7th International Workshop on Concrete Spalling due to Fire Exposure, BAM, Berlin, Germany.
9. GEOSUMAT received the Icelandic innovation award from the president of Iceland.

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10. GEOSUMAT seminar about materials for circular economy – industrial waste based geopolymers composites with hybrid reinforcement, May 21 2025, online event.

Dissemination activities that are currently in process (or planned):

1. Baronins J, Novakova I, Shishkin A, Fiala L, Zaleska M, Lukac F. "Theoretical Evaluation of the Effect of Locally Available Wood Waste Ashes on Waste-Substituted Geopolymer Mortar and Concrete Products in Norway" (under review)
2. Bogusz A., „Influence of recycled aggregate on selected geopolymer concrete properties” Master of Science dissertation, supervis. Mateusz Sitarz, Cracow University of Technology, Poland (in process).
3. Szczepański D., „The influence of recycled aggregate on the physical and mechanical properties of geopolymer concrete damaged by high temperature” Bachelor dissertation, supervis. Katarzyna Mróz, Cracow University of Technology, Poland (in process).
4. Cătălin-Marian O. "Obtaining and characterizing geopolymers reinforced with rubber particles with applicability in construction" Master of Science dissertation, supervis. Oana-Cristina Modoi, Cristina Roşu, Gabriel Furtoş, 2025 Babeş-Bolyai University, Romania.
5. Sitarz M, Zdeb T, et al, „Adhesion of polypropylene, steel and basalt fibres to the geopolymer matrix”, (under work)
6. CUT TEAM, „Evaluation of durability properties of geopolymer concretes with recycled aggregate” (under work)
7. CUT TEAM, „Mechanical properties of geopolymer concrete with fibre dispersed reinforcement ” (under work)
8. Setlak K. «Synthesis of geopolymer binders based on industrial waste» Doctoral dissertation, supervis. Michał Łach. Planned date - November 2025, Cracow University of Technology, Poland.