

Influence of the addition of waste glass and microbiological performance of metakaolin-based geopolymers cement

M. Catauro¹, A. D'Angelo¹, S. Piccolella², C. Leonelli³ and G. Dal Poggetto^{3*}

¹ *University of Campania "Luigi Vanvitelli", Department of Engineering, Via Roma n. 29-81031 Aversa, Italy, michelina.catauro@unicampania.it, antonio.dangelo@unicampania.it*

² *University of Campania "Luigi Vanvitelli", Department of Environmental, Biological and Pharmaceutical Sciences and Technologies, Via Vivaldi 43-81100 Caserta, Italy, simona.piccolella@unicampania.it*

³ *University of Modena and Reggio Emilia, Department of Engineering "Enzo Ferrari", Via P. Vivarelli n. 10- 41125 Modena, Italy, cristina.leonelli@unimore.it, giovanni.dalpoggetto@unimore.it*

**corresponding author: giovanni.dalpoggetto@unimore.it*

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Abstract.

Glass recycling reduces the amount of waste to be treated or disposed in landfills, allowing both to limit environmental damage and to save on the costs of transportation and disposal of waste. In this paper, an advantageous method for recycling glass containers (bottles, jars, jars for food, glasses and cans for drinks, etc.) is presented. The glass was crushed and without being washed or separated from any foreign bodies it was safely incorporated into a metakaolin-based geopolymeric matrix. Pure metakaolin and mixtures obtained by adding different percentages (30-50 wt%) of glass cullet were consolidated via alkali activation at 50°C. Infrared spectroscopy was able to reveal the formation of bonds in the mixtures between the geopolymeric matrix and the glass. Leaching tests were carried out to evaluate the eventual release of toxic metals, while the antibacterial tests completed the environmental evaluation of the final consolidated products that showed how the mechanical performance were modified by adding different amount of glass [1].

References

[1] G. Dal Poggetto, M. Catauro, G. Crescente and C. Leonelli. Efficient addition of waste glass in MK-based geopolymers: microstructure, antibacterial and cytotoxicity investigation. *Polymers*, 2021, 13, 1493.