

The Influence of Biofibres and Biomass Ash from Agricultural Wastes on Microstructure and Mechanical Properties of Cement-Based Composites

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Abstract. The utilization of sustainable materials in construction has gained significant attention in recent years due to environmental concerns. The replacing part of a cement with supplementary cementitious materials (substitution strategy) or improving the cement-based composites performances with the addition of recycled fibres (performance strategy) are some of the possible solutions to achieve sustainability goals. Biofibres derived from agricultural waste and wood ash, a by-product of biomass combustion, offer potential solutions to enhance the performance of cement-based composites while reducing environmental impact. This study explores the impact of biofibres from animal sources (such as sheep wool and pig hairs) and wood ash, a by-product of biomass combustion, used as an unconventional binder sourced from agricultural waste, on the microstructure and mechanical properties of a cement matrix. The research delves into the interactions between biofibres, wood ash, and cement, highlighting their collective effects and potential advantages in creating sustainable construction materials.

Keywords: Agricultural Waste, Animal Origin Fibres, Cement-Based Materials, Microstructure, Mechanical Properties.



fib International Conference on
Concrete Sustainability

11-13 September 2024 | Guimarães,
Portugal

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