

Special Issue

Preparation and Mechanical Properties of Low-Carbon High-Performance Cement-Based Composites

Message from the Guest Editors

The cement industry is undergoing a decisive shift as lowering CO₂ emissions and improving mechanical performance have become inseparable research priorities. At the same time, addressing these demands calls for integrated approaches spanning materials chemistry, mechanical characterisation, and sustainable design. This Special Issue welcomes original contributions on low-carbon, high-performance cement-based composites, spanning topics from fundamental binder design to structural-scale applications. Submissions may include original research articles, experimental and industrial studies, case studies, and critical reviews. Contributions are encouraged on a wide range of low-carbon composite systems, including those incorporating supplementary cementitious materials (SCMs) such as biochar, recycled cement paste, slag, and other industrial by-products, as well as LC3-based structural concretes. Particular emphasis is placed on studies addressing mechanical performance, durability, and microstructural characterisation, while techno-economic assessments of the use of industrial by-products and SCMs are also encouraged to support practical implementation and scalability.

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About the Journal

Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

Editor-in-Chief

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