

## **Fiber-Based 3D Cellular Reinforcing Structures for Mineral-Bonded Composites with Enhanced Structural Impact Tolerance**

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**Abstract :** The development of solutions to improve the resistance of buildings to short-term dynamic loads, particularly impact load, is driven by the urgent demand worldwide on securing human life and critical infrastructures. The research training group GRK 2250/1 aims to develop mineral-bonded composites that allow the fabrication of thin-layered strengthening layers providing available concrete members with enhanced impact resistance. This paper presents the development of 3D woven wire cellular structures that can be used as innovative reinforcement for targeted composites. 3D woven wire cellular structures are truss-like architectures that can be fabricated in an automatized process with a great customization possibility. The specific architecture allows this kind of structures to have good load bearing capability and forming behavior, which is of great potential to give strength against impact loading. An appropriate combination of topology and material enables an optimal use of thin-layered reinforcement in concrete constructions.

**Keywords :** 3D woven cellular structures, ductile behavior, energy absorption, fiber-based reinforced concrete, impact resistant

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