

# **A Two-Step Homogenisation Method for Elastic Properties of Ultra High Performance Fibre Reinforced Concrete (UHPFRC)**

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## **ABSTRACT**

A two-step homogenisation method is developed in this study to upscale the elastic properties of ultra high performance fibre reinforced concrete (UHPFRC) from microscale to macroscale. The microstructure of the material is characterised using micro-indentation and X-ray computed tomography (XCT) tests. In the first step, the cement matrix with sand particles and small voids are homogenised using an analytical approach. In the second step, the asymptotic numerical homogenisation procedure is applied on the homogenised mortar matrix, steel fibres and large voids, which are modelled by realistic XCT image-based finite element meshes. The results are compared with experimental data. The effect of the unit cell size is also studied.

## **REFERENCES**

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