Application of the fluid dynamics model to the field of fibre reinforced self-compacting concrete

Application of the fluid dynamics model to the field of fibre reinforced self-compacting concrete is a challenging task. Such simulations may clarify the evolution of fibre orientation and distribution which in turn significantly influences final mechanical properties of the cast body. We have developed such a computational model and briefly introduce it in this paper. The main focus of the paper is towards validation of the ability of the model to properly mimic the flow of the fibre reinforced self-compacting concrete. An experiment was conducted where a square slab was filled with the fibre reinforced self-compacting concrete. A computational tomography scanner together with an image analysis were used to obtain a field of fibre orientation tensors. These tensors were compared to the tensors obtained by the simulation. The comparison shows the ability of the model to predict the real behaviour of the self-compacting fibre reinforced concrete.

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