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Using of the reclaimed steels fibers on the strengthening of reinforced concrete frames structures

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ABSTRACT

This work is dedicated to the study of the influence of recovered and industrial metal fibres on the fracture behaviour of frames subjected to seismic stress. The objective is to revalue these fibres from steel from used tyres for reuse in the construction field. The modelling of frames is carried out using the Abaqus calculation code. We first calibrated the model by comparison with the experimental results of an ordinary concrete frame (control). Then, we determined the material parameters of fibre-reinforced concretes. Finally, we conducted simulations on frames where the nodal zones were reinforced with fibre-reinforced concretes with different percentages of fibres by weight. The results obtained showed the contribution of the reinforcement of nodal zones with fibre-reinforced concretes on the resistance and ductility of frames. We also showed that reinforcement with recovered fibres was as interesting as with industrial fibres. Finally, we were able to highlight the existence of an optimal size (length) of the reinforcement zone.

Keywords: Recycled fibres; Capacity; Frames; Reinforcement length; Nodal zones

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