

## Effect of Hooked-End Steel Fibres Geometry on Pull-Out Behaviour of Ultra-High Performance Concrete

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**Abstract :** In this study, a comprehensive approach has been adopted to examine in detail the effect of various hook geometries on bond-slip characteristics. Extensive single fibre pull-out tests on ultra-high performance matrix with three different W/B ratios and embedded lengths have been carried out. Test results showed that the mechanical deformation of fibre hook is the main mechanism governing the pull-out behaviour. Furthermore, the quantitative analyses have been completed to compare the hook design contribution of 3D, 4D and 5D fibres to assess overall pull-out behaviour. It was also revealed that there is a strong relationship between the magnitude of hook contribution and W/B ratio (i.e. matrix strength). Reducing the W/B ratio from 0.20 to 0.11 greatly optimizes the interfacial transition zone (ITZ) and enables better mobilization, straightening of the hook and results in bond-slip-hardening behaviour.

**Keywords :** bond mechanisms, fibre-matrix interface, hook geometry, pullout behaviour and water to binder ratio

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