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## Advanced Cement Based Materials

Volume 6, Issue 1, June 1997, Pages 1-20

Review article

# Interface property characterization and strengthening mechanisms in fiber reinforced cement based composites

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[https://doi.org/10.1016/S1065-7355\(97\)90001-8](https://doi.org/10.1016/S1065-7355(97)90001-8)

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### Abstract

The properties of the fiber/matrix interface are of primary significance for the overall behavior of fiber reinforced cement based composites. The present paper gives an overview of the current knowledge regarding characterization and engineering of the interface. First, different mathematical models for the characterization of interface properties are reviewed, including strength as well as toughness based models, and basic interfacial parameters are identified. Second, engineering tools are reviewed—primarily ways of increasing the fiber/matrix bond by applying various strengthening techniques, including introduction of fiber deformations, densification of the porous fiber/matrix interfacial transition zone, and fiber surface modification using plasma treatment. The strengthening mechanisms are quantified through basic interfacial parameters, and it is

shown by reference to available experimental evidence that substantial improvements in the fiber/matrix bond can be achieved, opening up the field for further optimization of fiber reinforced cement based composites. Finally, gaps in the present knowledge are pointed out, identifying areas of future research in this area.



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## Keywords

Fiber reinforced cement based composites; Fiber/matrix interface; Mathematical characterization; Interfacial friction; Fiber deformation; Interfacial transition zone; Plasma treatment

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