

Accepted Manuscript

Effect of Aggregate Size on Stress-strain Behavior of Concrete Confined by
Fiber Composites

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PII: S0263-8223(16)31469-6
DOI: <http://dx.doi.org/10.1016/j.compstruct.2017.02.087>
Reference: COST 8309

To appear in: *Composite Structures*

Received Date: 8 August 2016
Revised Date: 9 February 2017
Accepted Date: 22 February 2017



Please cite this article as: Jiang, C., Wu, Y-F., Jiang, J-F., Effect of Aggregate Size on Stress-strain Behavior of Concrete Confined by Fiber Composites, *Composite Structures* (2017), doi: <http://dx.doi.org/10.1016/j.compstruct.2017.02.087>

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1 **Effect of Aggregate Size on Stress-strain Behavior of Concrete Confined by Fiber**
2 **Composites**

3 Cheng Jiang¹, Yu-Fei Wu^{2*}, Jia-Fei Jiang³

4 **Abstract**

5 There is no consensus in extant literature on the size effect of fiber reinforced polymer (FRP)
6 confined concrete columns. This work studies the size effect by studying the influence of
7 aggregate size on the stress-strain behavior of FRP confined concrete. Experimental tests were
8 conducted on concrete cylinders with different aggregate sizes and fixed specimen dimensions.
9 Aggregate size shows no effect on the stress-strain behavior of unconfined concrete but has
10 significant effect in the transitional region of the stress-strain curve of FRP confined concrete.
11 However, no significant effect exists on the hardening slope of the stress-strain curve and the
12 ultimate strength of FRP confined concrete. Based on the experimental results and Bazant's law
13 of size effect, a new method is proposed for modeling the stress-strain relationship of FRP
14 confined concrete allowing for size effect.

15 **Keywords:** Concrete; Size effect; Aggregate size; FRP; Confinement; Stress-strain relationship.
16

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