

Abstract

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A New, Simple, Practical Method to Characterize Toughness of Fiber Reinforced Cement-Based Composites

• A simple and practical method to evaluate the toughness based on the flexural load-deflection curve is proposed, which overcomes many concerns surrounding the existing methods. The proposed method primarily considers the postcracking part of the load-deflection curve. The advantages of characterizing toughness in this region are that composite behavior in that region is most affected by the type of reinforcement, measurement errors are relatively small. By analyzing data from the literature, it was shown that this method can give similar results regardless of the method used for measuring deflection, making this method applicable to test facilities of varying sophistication. Some advantages of the proposed method include: clear identification of the first crack point, the use of toughness indexes that are independent of the first crack deflection (where measurement error is greater); quantitative representation of the load-deflection curve shape through the use of four postcracking toughness indexes, quantitative representation of the overall composite toughness through a single parameter.