

Steel fiber bond strength to estimate fRi parameters

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Abstract

This paper presents the results of the safety assessment of the β coefficient that correlates the residual flexural tensile strength parameters f_{Ri} ($i = 1, 2, 3$, and 4) in steel fiber reinforced concrete (SFRC), collected through experimental notched beam flexural tests in three points, according to the fib Model Code 2010 (fib, 2013), with the bond strength ($f_{u,f}$) of the hook-end type steel fiber in the concrete mix. The SFRC beams were chosen, which presents the load-opening ratio curve of the crack, F-CMOD (Crack Mouth Opening Displacement) in softening behavior, the compressive strength of the concrete, $25 \text{ MPa} < f_c < 80 \text{ MPa}$, the fiber volume content, $0.25 \% < V_f < 0.80 \%$ and the fiber aspect ratio, $60 < l_f/d_f < 95$. The results in 46 prisms notched of the database formed by 13 studies, showed a considerable influence of the $f_{Ri} \times f_{u,f}$ ratio with lower variability of around 10%. Thus, through statistical resources, empirical proposals were established to estimate the residual flexural tensile strengths, as a viable and economical alternative to the design project.

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