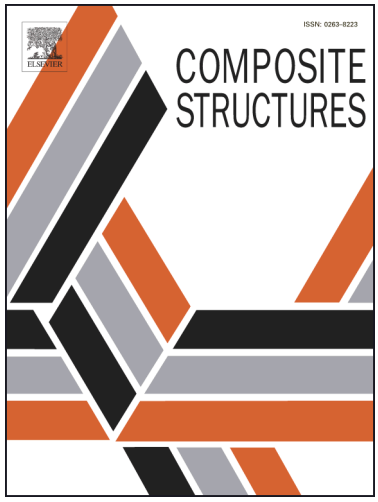


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# Crack-closing performance of NiTi and NiTiNb fibers in cement mortar beams using shape memory effects

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***Abstract*:** This study evaluated the crack-closing performance of NiTi and NiTiNb shape memory alloy (SMA) fibers in cement mortar beams. In addition, the effects of the geometry and number of SMA fibers were evaluated. For this purpose, material tests were performed to assess the mechanical and thermal properties of the SMA fibers, as well as the components and shape recovery ratios. Three-point bending tests were then carried out to generate a crack approximately 0.5 mm wide in cement mortar beams with the SMA fibers, which were placed along an artificial crack in the bottom of the beam at mid-span. The crack-closing performance of the SMA fibers was evaluated with the increase in temperatures and the number of fibers. The crack-closing ratios were more efficient in straight-shape and NiTi fibers.

***Keywords:*** SMA fiber; shape memory effect; crack-closing; mortar beam; fiber-reinforced cement composite