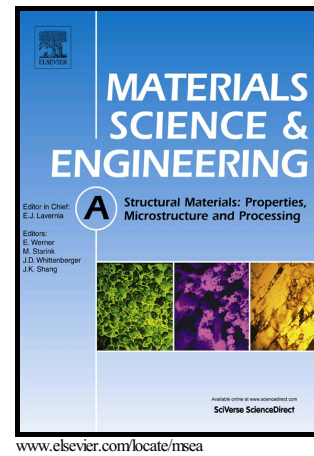


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**Effect of the thermomechanical coupling on fatigue crack propagation
in NiTi Shape Memory Alloys**

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Abstract

In this paper, the effect of thermo-mechanical coupling on fatigue crack propagation in a NiTi pseudo-elastic shape memory alloy (SMA) is investigated. Single Edge Crack (SEC) specimens are loaded at different frequencies to see the effect of frequency on mechanical response of the edge cracked NiTi plate. The crack length and the temperature at the crack tip are measured using an Infrared Thermography (IR) camera. In particular, the evolutions of the maximum temperature at the crack tip and the crack length with respect to number of loading cycles at different loading frequencies are plotted. The results show that the crack growth rate is significantly frequency-dependent, and the growth rate decreases with increasing frequency.

Keywords

Shape memory alloys, fatigue, loading frequency, crack propagation, thermo-mechanical coupling

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