

Abstract Submitted  
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**Longitudinal and Lateral Stress Measurements in NiTi Under One-Dimensional Shock Loading** Y. MEZIERE, Cranfield University, J.C.F. MILLETT, Cranfield University, N.K. BOURNE, University of Manchester, A. WALLWORK, A. WORKMAN, AWE — Interest has been shown recently about the behavior at high strain rate of the shape memory alloy NiTi. However, the dynamic properties are not yet fully determined and the shear strength at under shock loading conditions has been little considered. This paper investigates the influence of the impact stress on the values of the shear stress under one-dimensional shock loading. The shear stress is defined by measuring the longitudinal and the lateral stresses. New data in terms of shock stress, particle velocity and shock velocity are gathered. The lateral stress was then determined using manganin stress gauge located inside the material. Results indicate that the lateral stress has a positive dependence upon the impact stress. A gradual decrease of the lateral stress was also observed while the longitudinal stress remains constant for the duration of the pulse length. This suggests that the shear strength increases behind the shock front. This also could reveal a complex mechanism of deformation behind the shock front during loading.

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