

Abstract Submitted  
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**Equation of State and Shear Strength of Nickel and Ni-60Co Under One-Dimensional Strain** A. WORKMAN, AWE, Y. MEZIERE, J.C.F. MILLETT, Cranfield University, N.K. BOURNE, University of Manchester, A. WALLWORK, AWE — If the understanding of the behaviour of metallic materials under shock loading of materials is to increase, knowledge of the influence of an alloying element is required. The dynamic response of pure nickel (Ni), and its alloy, Ni-60Co (composed of 60% by weight of cobalt), had been investigated during one-dimensional shock loading. Nickel and cobalt have similar atomic characteristics and the alloy Ni-60Co is face-centered cubic structure (fcc) as is nickel. Few materials' properties are thus changed. The only altered feature is the reduced stacking fault energy (SFE) for the Ni-60Co. The shear strength at high rates of strain has also been little considered for these two materials. This paper thus investigates the effect of this reduced SFE on the shear strength. New data are then presented, in the stress range 0-15 GPa, in term of shock stress, lateral stress, particle velocity and shock velocity. The influence on the shear stress  $\tau$ , of cobalt additions in nickel is then investigated and presented. Results indicate that the lateral stress is increasing in both materials with the increasing impact stress. It was found to be higher in the nickel than in the Ni-60Co. The progressive decrease of the stress during loading indicate a complex mechanism of deformation behind the shock front.

J.C.F. Millett  
Cranfield University

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