

Abstract Submitted  
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**Evidence for Friction Between Crack Surfaces During Deformation of Composite Plastic Bonded Explosives<sup>1</sup>** DONALD WIEGAND, BRETT REDDINGIUS, Picatinny, KEVIN ELLIS, CLAIRE LEPPARD, AWE Aldermaston UK — The compressive strength has been found to increase linearly with hydrostatic pressure in a low pressure range in which work softening due to crack damage is observed. Analysis indicates that this linear increase can be attributed to friction between the surfaces of closed cracks and a friction coefficient is obtained from the linear slope and the measured angle of the failure plane. Analysis also indicates that the plane of maximum shear stress, the failure plane, is greater than 45 degrees when friction is present\* as observed and a friction coefficient is also calculated directly from this angle. In addition, a relationship between the ratio of compressive to tensile strengths and the friction coefficient has been given by Zuo and Dienes\*. The observed ratio is greater than the predicted value without friction and a friction coefficient is obtained which is in agreement with the two values obtained as discussed above. This agreement of three independent measures of the friction coefficient is taken as strong evidence for the presence of friction. This friction can be the source of hot spots and ignition during deformation\*. \*Zuo, Q. H., and Dienes, J. K., LA-13962-MS (2002).

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