

Abstract Submitted
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The Roll of Friction in the Mechanical Failure Properties of a Polymer Particulate Composite DONALD WIEGAND, BRETT REDDINGIUS, ARDEC, Picatinny, NJ USA, KEVIN ELLIS, CLAIRE LEPPARD, AWE, Aldermaston, U — The mechanical failure properties of a composite containing an organic crystalline particulate and a polymer-plastizer binder have been investigated as a function of hydraulic pressure between 0.1 and 138 MPa. The results indicate that in a low pressure range between about 0.1 and 7.0 MPa crack processes are important in failure. The pressure dependence of the compressive strength is attributed to coulomb friction between surfaces of closed cracks⁺, and from the observed linear increase of the strength with pressure a friction coefficient is obtained. Friction coefficients can also be obtained from the ratio of compressive to tensile strength and in addition from the angle which the failure plane makes with the direction of the applied stress. both at 0.1 MPa⁺. The friction coefficients obtained from these three separate observations are in agreement and this is taken as strong evidence for the importance of this friction in determining strength and mechanical failure for this composite. ⁺Dienes, J. K., 1983. J. Geophysical Research 88: 1173 – 1179. Zuo, Q. H. and Dienes, J. K., 2002. LA-13962-MS.

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