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Shear Strength of Aluminum Oxynitride DATTATRAYA P. DANDEKAR, US Army Research Laboratory, Aberdeen Proving Ground, MD 21005, BRIAN A. M VAUGHAN, WILLIAM G. PROUD, PCS, Cavendish Laboratory, Madingley Road, Cambridge, CB3 0HE, UK. — Aluminum oxynitride (AlON) is a transparent, polycrystalline cubic spinel. The results of investigations[1−4] on shock response of AlON permit determination of the equation of state, and shear strength retained under shock compression. Whereas the values of the HEL of AlON holds no surprises, the inelastic response of AlON reported in Ref. 1-4 differ significantly and is stress dependent. The results of Ref. 1-2 show that AlON retains a shear strength of 3 to 4 GPa when shocked up to around 20 GPa, but the results of Ref, 3-4 seem to suggest a possible loss of shear strength when shocked to 16 GPa and beyond. Our analysis examines the observed differences in the inelastic response of AlON reported in these four studies . 1. J. U. Cazamias, et. al., in Fundamental Issues and Applications of Shock-Wave and High Strain Rate Phenomena, Eds. Staudhammer, Murr, and Meyers, Elsevier, NY, 173 (2001). 2. B. A. M. Vaughn, et.al., Shock Physics, Cavendish Laboratory, Report SP/1092 (2001) 3. T. Sekine, et.al., *J. Appl. Phys.* **94**, 4803 (2003). 4. T. F. Thornhill, et.al., Shock Compression of Matter-2005, Eds. Furnish, Elert, Russell, White, AIP, NY, 143 (2006).

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