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Characterization of Impact Initiation of Aluminum-Based Powder Compacts MICHAEL TUCKER, SEAN DIXON, NARESH THADHANI, Georgia Institute of Technology — Impact initiation of reactions in quasi-statically pressed powder compacts of Al-Ni, Al-Ta, and Al-W powder compacts is investigated in an effort to characterize the differences in the energy threshold as a function of materials system, volumetric distribution, and environment. The powder compacts were mounted in front of a copper projectile and impacted onto a steel anvil using a 7.62 mm gas gun at velocities up to 500 m/s. The experiments were conducted in ambient environment, as well as under a 50 millitorr vacuum. The IMACON 200 framing camera was used to observe the transient powder compact densification and deformation states, as well as a signature of reaction based on light emission. Evidence of reaction was also confirmed based on post-mortem XRD analysis of the recovered residue. The effective kinetic energy, dissipated in processes leading to reaction initiation was estimated and correlated with reactivity of the various compacts as a function of composition and environment.

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