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Impact fragmentation and ballistics of pressed aluminum powder projectiles SAM THUOT, JOSEPH HOOPER, RICHARD LEE, JOHN WILKINSON, JOEL CARNEY, JIM LIGHTSTONE, Indian Head Division, Naval Surface Warfare Center — The penetration and fragmentation characteristics of spheres made of pressed aluminum powder are studied via normal impact on thin steel plates at 0.6 to 2.5 km/s. Ultra-high speed photography and flash x-rays are used to monitor the formation and evolution of the debris cloud formed by impact. The mass distribution of debris fragments is measured directly via a soft-catch experiment. Experimental results are compared to simple analytic theories of brittle fragmentation and spall. Additional experiments in which the debris is allowed to strike a thick steel anvil result in significant energy release via particle combustion. This data aids in understanding the mechanical properties and potential energy release of porous reactive materials.

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