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The Effects of the Flyer Plate's Radius of Curvature on the Performance of an Explosively Formed Projectile PHILLIP MULLIGAN, JASON BAIRD, JOSHUA HOFFMAN — An explosively formed projectile (EFP) is known for its ability to penetrate vehicle armor effectively. Understanding how an EFP's physical parameters affect its performance is crucial to development of an armor capable of defeating such devices. The present study uses two flyer plate radii of curvature to identify the experimental effects the flyer plate's radius of curvature has on the measured projectile velocity, depth of penetration, and projectile shape of an EFP. The Gurney equation is an algebraic relationship for estimating the velocity imparted to a metal plate in contact with detonating explosives (1). In their attempts to calculate an EFP theoretical flyer plate velocity, the authors of this research used the open-faced-sandwich Gurney equation, whereby a semi-infinite slab of explosive is in intimate contact with a semi-infinite metal flyer plate. This equation uses the flyer-weight to charge-weight ratio and the specific explosive kinetic energy to calculate the theoretical flyer plate velocity. Two EFP designs that have two different flyer plate radii of curvature, but the same physical parameters and the same flyer-weight to charge-weight ratio should theoretically have the same velocity. Test results indicate the flyer plate's radius of curvature does not affect the projectile's velocity and that using a flat flyer plate negatively affects projectile penetration and formation.

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