

Abstract Submitted
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Detonation Failure Thickness Measurement in an Annular Geometry DAVID B. MACK, OREN E. PETEL, ANDREW J. HIGGINS, McGill University — The failure thickness of neat nitromethane in aluminum confinement was measured using a novel experimental technique. The thickness was approximated in an annular geometry by the gap between a concentric aluminum tube and rod. This technique was motivated by the desire to have a periodic boundary condition in the direction orthogonal to the annulus thickness, rather than the free surface that occurs in a typical experiment in a rectangular prism geometry. This results in a two-dimensional charge analogous to previous failure thickness setups but with infinite effective width (i.e. infinite aspect ratio). Detonation propagation or failure was determined by the observation of failure patterns engraved on the aluminum rod by the passing detonation. Analysis of these engraved patterns provides a statistical measurement of the spatial density of failure waves as the failure thickness is approached. The failure thickness was measured to be 0.76 mm \pm 0.25 mm, which agrees with previous results, obtained using a rectangular prism geometry.

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