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Comparison of Failure Thickness and Critical Diameter of Nitromethane OREN E. PETEL, ANDREW J. HIGGINS, McGill University, Mechanical Engineering Department, Montreal, Quebec H3A 2K6 Canada — The critical diameter and failure thickness of liquid nitromethane confined by aluminum are determined experimentally. A comparison of these two parameters provides insight into the failure mechanism in nitromethane. If the failure of detonation in a critical charge diameter (or thickness) experiment is due to reaction quenching resulting from wave curvature, then it is expected that the critical diameter should be half the value of the critical thickness.[1] This has been shown to be the case with gas-phase detonations with nearly laminar reaction zones.[2] By comparing the experimentally determined values of critical diameter and thickness for a homogeneous liquid explosive, the validity of this model of detonation failure can be assessed. References: 1. Ramsay, J.B., 8th Symp. (Int.) on Detonation., 372-379 (1985). 2. Radulescu, M., Lee, J.H.S., Comb. and Flame, 131:29-46 (2002).

Oren E. Petel
McGill University, Mechanical Engineering Department, Montreal, Quebec H3A 2K6 Canada

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