

Abstract Submitted
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Detonation Velocity–Diameter Relation in Gelled Explosive with Inert Inclusions ANDREW HIGGINS, JASON LOISEAU, XIAOCHENG MI, McGill University — The detonation velocity is measured in a gelled explosive that has been sensitized via the addition of glass microballoons (GMBs) and additionally diluted via the inclusion of large scale (300-700 micron) inert inclusions. The base explosive is nitromethane that has been gelled via the addition of poly(methyl methacrylate) and then sensitized via hot-spot inducing glass microballoons. Inert inclusions (e.g., glass, steel beads) are then added to the explosive to make a heterogeneous explosive with heterogeneities that are at a scale disparate from those of the microballoons. This system has the potential to be a synthetic explosive that can be tuned to have the properties of more complex commercial blasting agents. The velocity-diameter relation is studied using weak confinement (polyvinyl chloride) and time-of-arrival gages. The results are also used to further explore the phenomenon of anomalous scaling between axisymmetric charges (cylinders) and two-dimensional (slab) charges.

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