

Abstract Submitted
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Effects of heat-treatment and explosive brisance on fragmentation of high strength steel JAMES STOLKEN, MUKUL KUMAR, Lawrence Livermore National Laboratory, VLADIMIR GOLD, ERNEST BAKER, Armament Research Development & Eng, LAWRENCE LIVERMORE NATIONAL LABORATORY COLLABORATION, ARMAMENT RESEARCH DEVELOPMENT & ENG COLLABORATION — Tubes of AISI-4340 steel were heat-treated to three distinct microstructures resulting in nominal hardness values of 25 Rc, 38 Rc and 48 Rc. The specimens were then explosively fragmented using TNT and PETN. The experiments were conducted in a contained firing facility with high fragment collection efficiency. Statistical analyses of recovered fragments were performed. Fragment rank-order statistics and generalized goodness-of-fit tests were used to characterize the fragment mass distributions. These analyses indicated significant interaction effects between the heat-treatment (and the resulting microstructure) and the explosive brisance. The role of the microstructure in relation to the yield-strength and toughness will also be discussed. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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