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TNT Equivalency Testing for Energetic Materials KEVIN M. JAANSALU, CHRISTELLE COLLET, ERNEST L. BAKER, MARTIJN M. VAN DER VOORT, Munitions Safety Information Analysis Center (MSIAC), NATO HQ, Brussels, Belgium — TNT equivalency is commonly used to quantify the explosive effects of energetic materials and munitions. For blast lethality calculations, we need a set of accurate TNT equivalence values for the effects we are considering and, if relevant, at different distances. For safety purposes on the other hand, we need conservative, but reasonable values, and if possible, standardized ones. For standardized safety calculations, TNT equivalence methodology is not only applied to high explosives, but to all energetic materials including propellants and pyrotechnics. Although explosive blast testing methods for TNT equivalence characterization tends to be fairly similar, there is surprisingly little standardization. For propellants and pyrotechnics, there is no standardization at all. A review of blast testing methods and data reduction for TNT characterization was conducted for high explosives, propellants and pyrotechnics. Very large differences in results are noted with many factors affecting the results. Some of these factors include initiation or ignition method, munition confinement, testing geometry and data reduction methodology. The various testing methods are reviewed, resulting in conclusions and recommendations.

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