

Abstract Submitted
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The Role of Binders in Controlling the Explosiveness of HMX/HTPB Compositions MALCOLM COOK, PETER HASKINS, QinetiQ, CHRISTOPHER STENNETT, RMCS Shrivenham, RICHARD BRIGGS, QinetiQ — There is a clear difference in cook-off vulnerability between compositions such as LX-14 (pressed 95% HMX-5% binder), which yield violent responses, and Rowanex 1100 (cast 88% HMX-12% binder), which yields relatively mild responses. These two classes of composition differ primarily in three features: the binder quantity, the bulk moduli of the binders, and the manufacturing method. An experimental study was conducted in an attempt to determine which of these features, under cook-off conditions, is the most important in governing explosiveness. Here we describe a series of small-scale cook-off experiments in which pressed compositions of 88%, 91%, 95% and 96% HMX, mixed with cured, cross-linked HTPB, were studied. The experiments used a novel glass-windowed test vehicle, instrumented internally with thermocouples. A trend of increasing event violence with increasing proportion of HMX was found, although in none of the experiments was a detonation recorded. The results from these experiments are discussed with reference to the binder characteristics and manufacturing method used.

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