

Abstract Submitted
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Small-Scale Tunnel Tests for Blast Performance JOSHUA FELTS, RICHARD LEE, NSWC Indian Head — The data reported here provides a validation of a small-scale tunnel test as a tool to guide the optimization of new explosives for blast performance in tunnels. The small-scale arrangement consisted of a 2-g booster and 10-g sample mounted at the closed end of a 127-mm diameter by 4.6-m long steel tube with pressure transducers along its length. The three performance characteristics considered were peak pressure, initial energy release, and impulse. The relative performance from six explosives was compared to that from a 1.16-m diameter by 30-m long tunnel that used 2.27-kg samples. The peak pressure and impulse vs. distance did not scale between the small and larger scale tests but the relative ranking was preserved. The initial energy release was determined from a one-dimensional point-source analysis, which tracked with peak pressure vs. distance results but not with impulse suggesting additional energy released further down the tunnel for some explosives. This test is a viable tool for optimizing compositional variations for blast performance in target scenarios of similar form factor.

Joshua Felts
NSWC Indian Head

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