Missile Systems Lethality Enhancement through the use of a Conducting Aerosol Plasma Warhead

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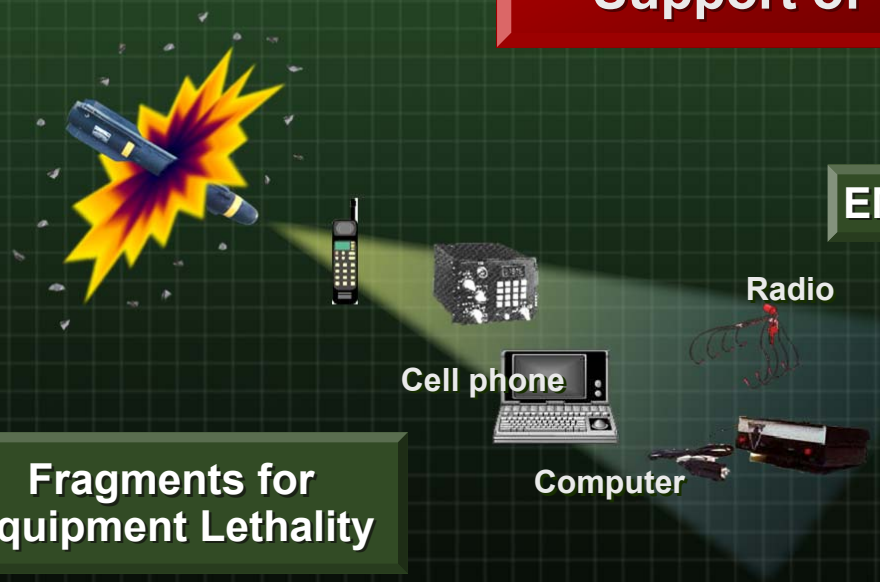
Multi-Functional Warheads Are Lethal Against a Large Target Set

- Enhanced blast and fragmenting warheads have been successfully combined with shaped charges to service multiple target types with the same missile warhead, such as in Joint Common Missile. These are termed multi-purpose warheads.
- The next class of future missile systems can be further improved by adding RF effects to broaden the target set and enhance lethality
- The first step is to demonstrate additional effects without degrading existing capabilities

Multi-Effects Electromagnetic Warhead

Develop and Integrate Warheads into Missile Systems to Destroy and Disable Electronic Systems and their Operators in Support of Combat Forces

Enhanced Blast for Personnel Lethality



EMP for Electronics

Fragments for Equipment Lethality

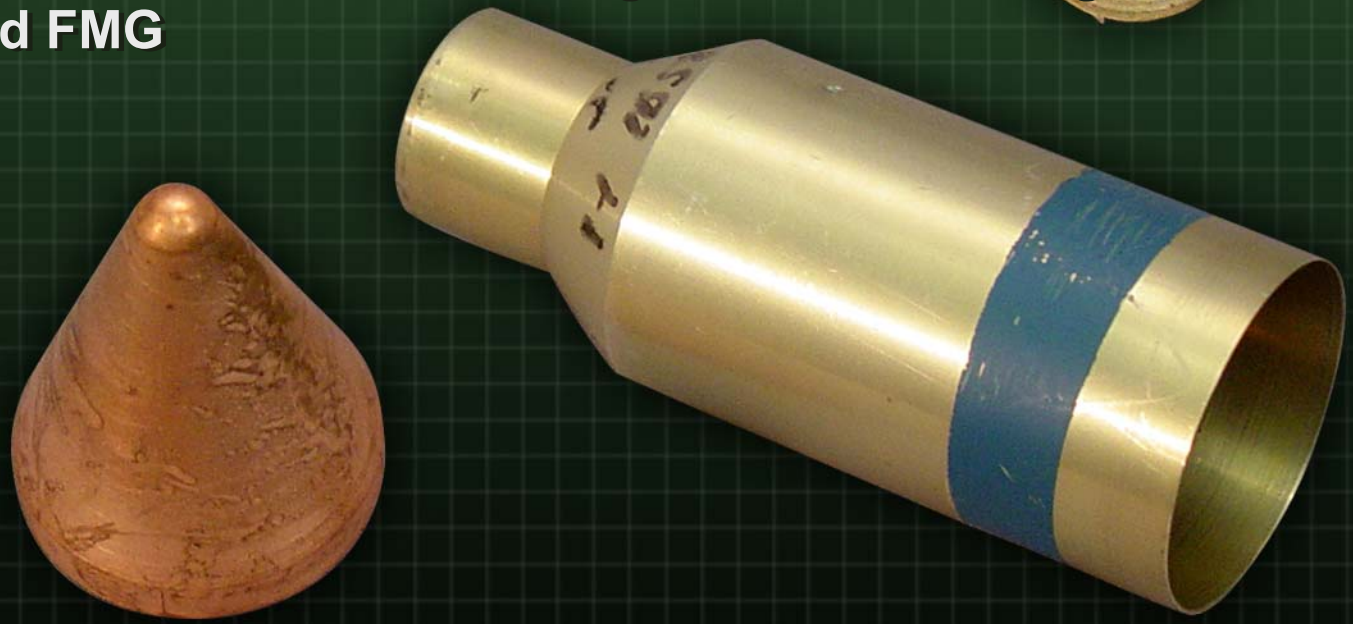
Three Major Products From Missile Laboratory to Missile Programs

- Improved Anti-Armor Precursor Charge
- Enhanced GMLRS Bomblet or Cargo Round payload
- Next Generation 2.75” Rocket Warhead

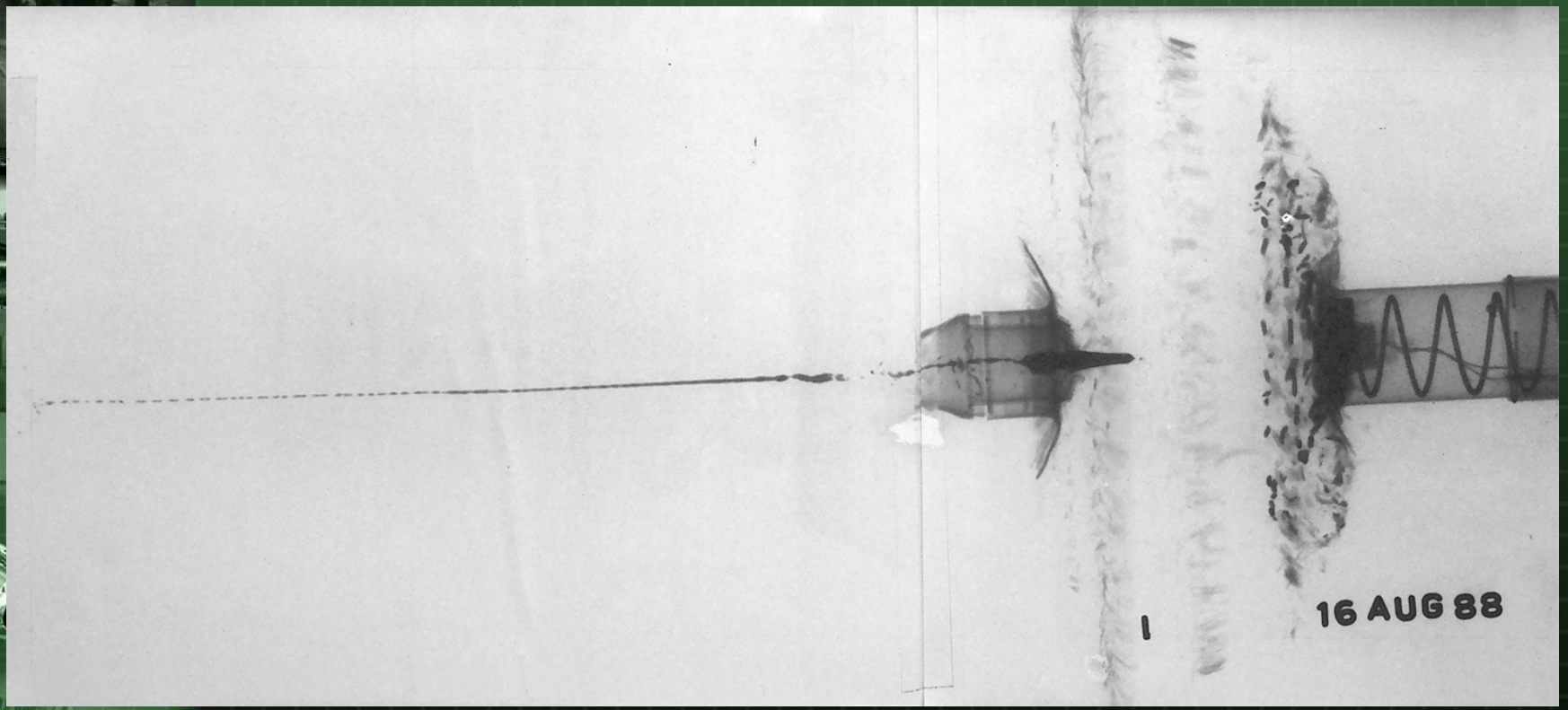
Baseline Warhead Trade Studies

- EM Measurements of Detonations and Plasma Characterizations
- Non-Ideal Explosives for Shape Charges/ Conductive Metal Antennas and Masonry destruction

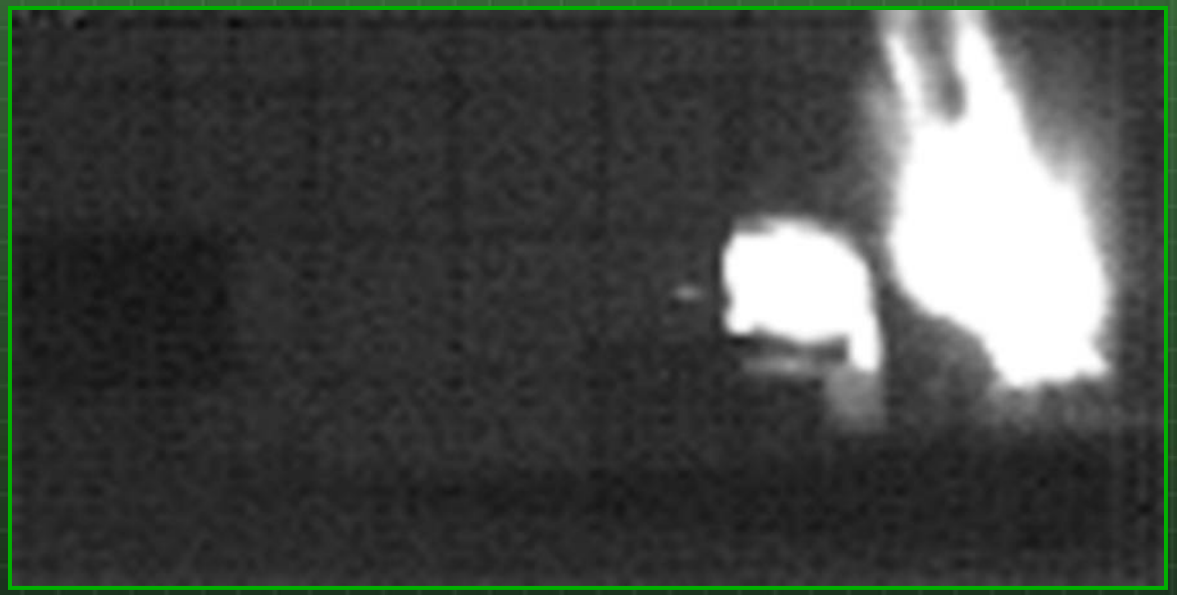
Improved Seed Sources Program, SBIR leverage of FEG and FMG

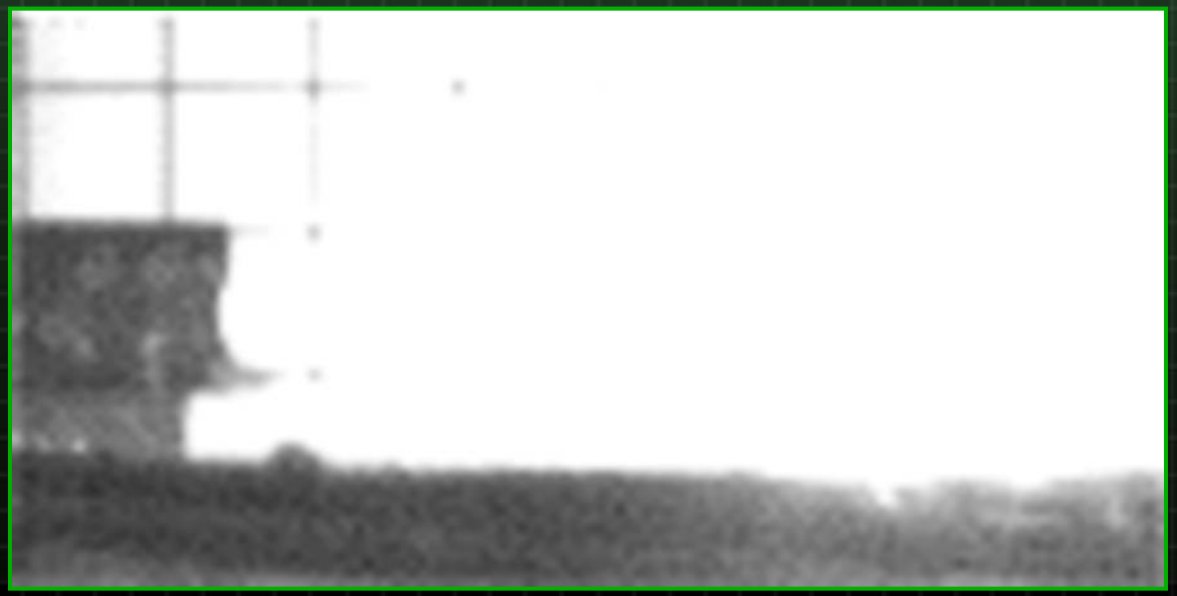


TOW Tip Charge Flash X-ray



Plasma Entrainment





Test Set-Up

Test Article N5 and Metal Fuel Rich Mix

Filled test Article

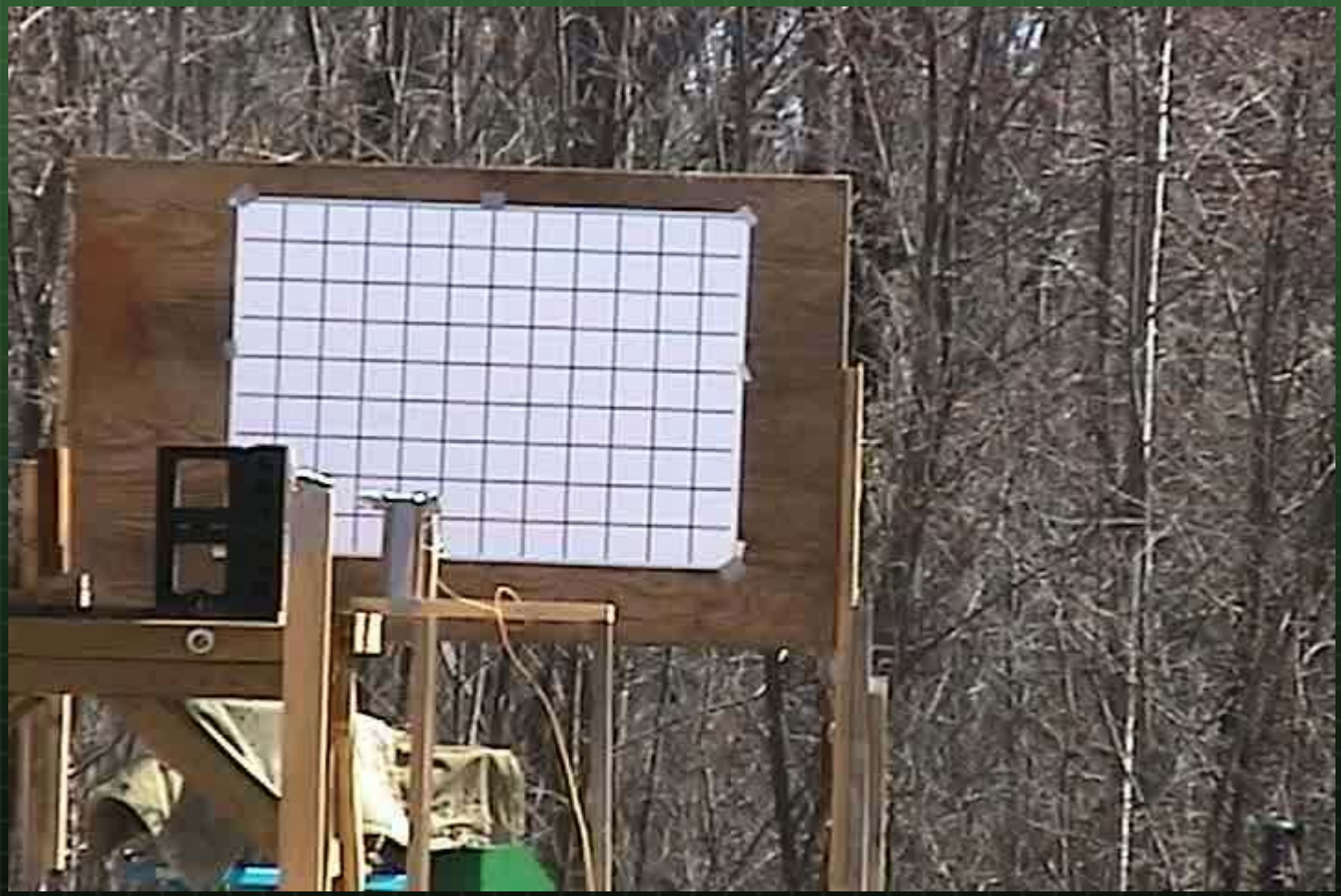
Representative Cover Plates

Demonstration of Deflagration Effects on Masonry Targets

- Test various mixes of approximately 50 grams of aluminum powder pyrotechnic and thermite
- Gather fireball size, expansion rate and duration data for modeling efforts
- Investigating switch timing requirements to load dynamic plasma antenna
- Demonstrate robustness of masonry destructiveness at 10 CDs stand-off

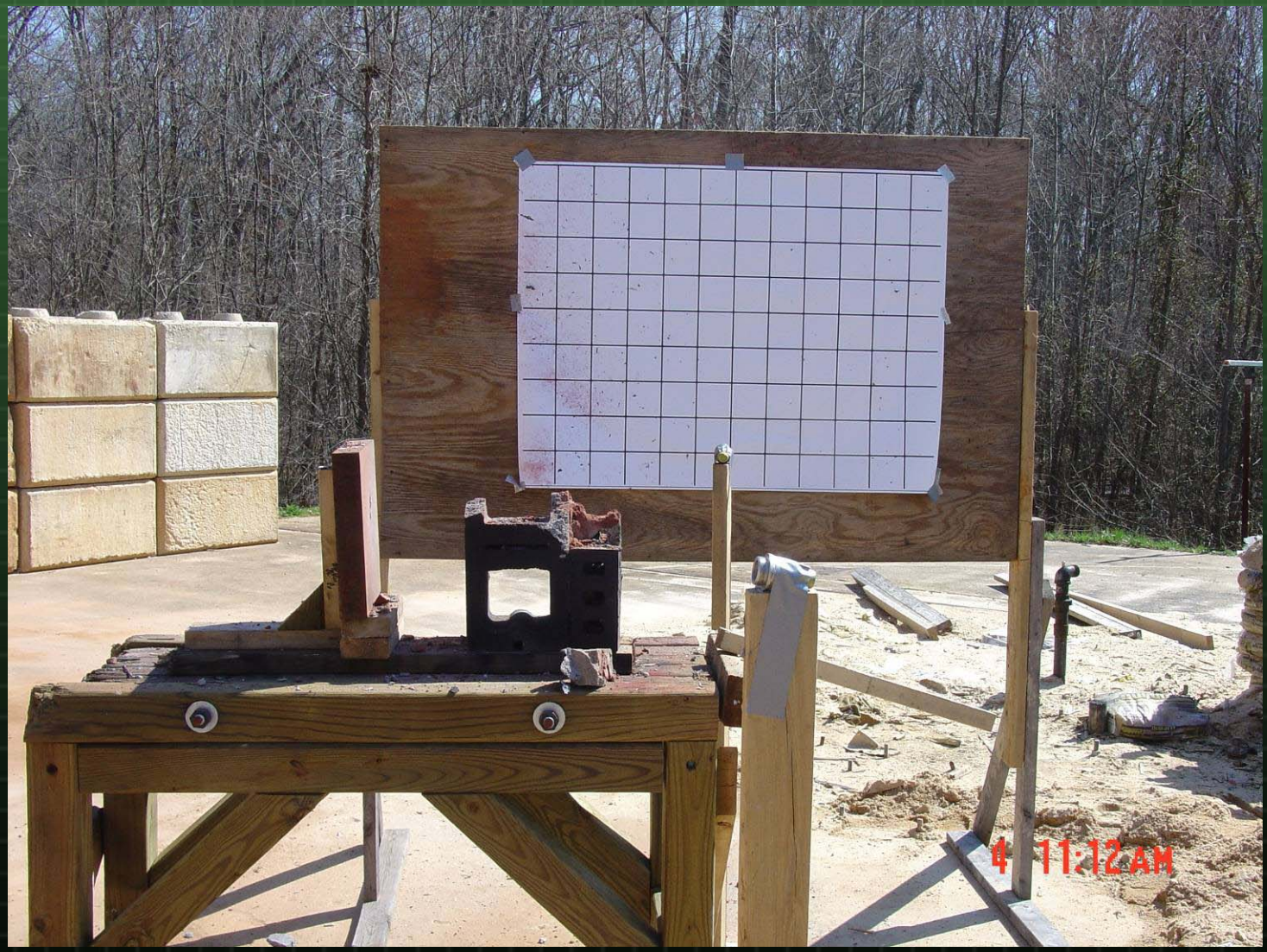
Test 1

Test 1 Video



Test 1 – High Speed Video

Test 1 – Masonry Destruction



Test 2

Test 3

Test 4

Test 5

Test 6

Test 7

Conclusions and Plans

- Conductive Plasmas made from Deflagrating mixtures have significant destructive effects on masonry
- Significant Differences in Similar Mixes Allow the EM Designer a Robust set of Design Characteristics
- Temperature and Conductivity Effects will be further tested this Summer

Thanks

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