



## U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND

# MANUFACTURING TECHNOLOGY SUCCESS STORY

## Additive Manufacturing of Energetics and Electronics

### PROBLEM / OBJECTIVE

The ammunition industrial base is very specialized, including unique processes, facilities and equipment for the various types of ammo produced. Production of specialty ammo has declined, which could lead to insufficient supplies. Additionally, existing manufacturing processes are not able to fabricate integrated electronic and energetic components for the small volume design envelopes needed to support next generation munitions. Customer concerns include the ability for manufacturing processes to economically accommodate low quantity runs while maintaining the performance, reliability and safety requirements of a munition.

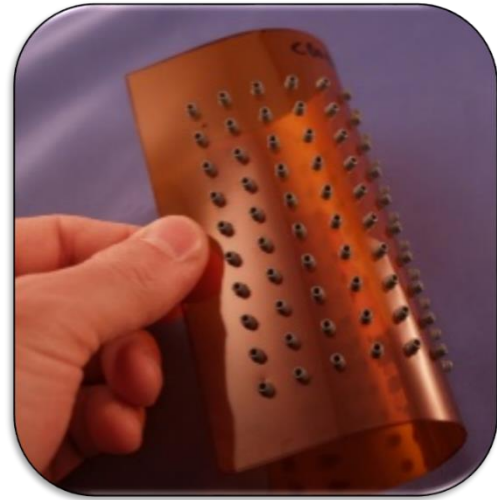
The objective of this ManTech project was to develop a flexible and agile common munition component manufacturing process utilizing advanced processing technologies to integrate energetics and electronics.

### ACCOMPLISHMENTS / PAYOFF

This project resulted in substantial process improvements for manufacturing integrated energetic and electronic devices used in munitions. Additional achievements include automated processing approaches for hazardous explosive mixing and deposition. The accomplishments include:

- Developed assembly line for energetic components with improved safety by reducing or eliminating human touch points
- Developed and demonstrated flexible production lines for munitions load, assembly and pack processes that accommodate multiple products without significant changes to in-line tooling
- Reduced National Technology Industrial Base footprint & logistics for ammunition load, assembly and pack

- Developed advanced manufacturing capabilities for current and new munitions
- Demonstrated capability for mobile Ammo-on-Demand for in theater manufacturing.



Advanced manufacturing capabilities were demonstrated by additively manufacturing energetic munition components. (Photo credit: U.S. Army)

This ManTech project supports the Army's Soldier Lethality modernization priority by improving energetic and electronic integration approaches enabling new capabilities for reduced size munition components.

### PARTICIPANTS

This project was executed by the U.S Army Combat Capabilities Development Command Armaments Center, Picatinny, New Jersey, in collaboration with academia and industry partners.

The project transitioned to the Joint Program Executive Office Armaments & Ammunition and industry partners continue to mature the technology for current and future Army munitions.