



MANUFACTURING TECHNOLOGY SUCCESS STORY

Additive Manufacturing for Weapon Systems Components

PROBLEM / OBJECTIVE

The Army has been actively pursuing Additive Manufacturing, or AM, technology to repair worn and damaged weapon systems components that can no longer be used, as well as provide a manufacturing source for parts that have long lead times or are no longer available in the supply chain. While AM technology has great potential to reduce the logistic trails and improve mission readiness for rapid response items, it has not met repeatability and reliability requirements to realize the full benefits across the Department of Defense.

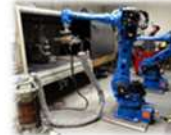
The AM for New Build, Remanufacturing, and Life Extension of Weapons System Components project developed and matured additive fabrication and repair processes to provide a viable method to build and repair weapon systems components. The project focused on three additive technology areas critical to the repair and new build of weapon systems: Cold Spray, Laser Engineered Net Shaping and Direct Metal Laser Sintering.

ACCOMPLISHMENTS / PAYOFF

This project resulted in developing and demonstrating additive manufacturing technologies for military use in repair and fabrication of weapon system components. Accomplishments include:

- Repaired components via LENS and Cold Spray with developed repair procedures
- Published technical report on 4340 Steel AM processing via America Makes
- Fabricated new components via AM for testing and approved AM metals Technical Data Package
- Achieved 10%-50% cost savings, and up to 50% reduction in lead time for AM repairs
- Increased readiness and logistics impact through AM repair and fabrication

Cold Spray (CS)



Laser Engineered Net Shaping (LENS)



Direct Metal Laser Sintering (DMLS)



AM is used for new build, remanufacturing & life extension of Army weapon systems components. (Photo credit: U.S. Army)

Technology transition was highlighted by the delivery of repair procedures conducted at an Army depot, as well as the delivery of AM technical data and hardware to Program Managers and Army research & engineering centers.

This ManTech project supports the Army's Long Range Precision Fires modernization priority by providing a solution for significantly improving readiness by reducing component lead time, repair time, and cost.

PARTICIPANTS

This project was executed by the U.S. Army Combat Capabilities Development Command Armaments Center in collaboration with the following Army Centers, organic industrial base and industry partner:

- CCDC Army Research Laboratory
- Anniston Army Depot
- CCDC Ground Vehicle Systems Center
- CCDC Chemical Biological Center
- Honeywell Aerospace - Advanced Technology