

Additive Manufacturing and Integration of Electronics for Military Systems and Applications

James L Zunino III, ARDEC Project Officer, US Army RDECOM, Picatinny Arsenal,
Rockaway Township, NJ, 973-724-6773
E-Mail: james.l.zunino.civ@mail.mil

Abstract

Recent advances in additive manufacturing have enabled the U.S. Army to design and develop numerous new processes and applications for munitions and weapons systems. Researchers at the Army's Research Development and Engineering Command (RDECOM) are working to ensure that U.S. forces continue to operate from a position of overwhelming military advantage. Additive manufacturing, including printed electronics, has allowed revolutionary changes in design, materials, and fabrication of components and sub-systems for numerous military applications. Integrating printed electronics onto/into structures and hybrid devices is shaping how the Army designs, fabricates, integrates, manufactures, and tests Fuzes, Munitions, Antennas, Power Solutions, and other systems. These capabilities are helping the Department of Defense (DoD) and its strategic partners to capitalize on these technological breakthroughs and to develop systems that are "smarter," more rapidly deployable, lighter and smaller. The current state-of-the-art and future concepts pertaining to printed technologies within the US Army will be presented. Applications and highlighted progress of several DoD and Government programs will be addressed, including printed electronics, hybrid devices, materials, and integration of printed electronics & 3D printed structures for initiation systems, antennas, sensor systems, and prognostics & diagnostics. These advances will optimize existing systems, develop new systems, and allow the DoD to maintain their decisive edge.