

# ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

*“Providing America Advanced Armaments  
For Peace And War”*

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## Introduction

The Armament Research, Development and Engineering Center (ARDEC), headquartered at Picatinny Arsenal, NJ, is sometimes called the Army center for lethality because it is the origin of more than 90 percent of the Army's lethality.

ARDEC's overall mission is to improve fielded items; develop new items; maintain a strong armament technology base in government, industry, and academia; and provide technical support to soldiers in the field. By accomplishing these objectives, ARDEC achieves its vision of “Providing America Advanced Armaments for Peace and War.”

ARDEC is an organization whose entire fabric is committed to providing its ultimate customer, the soldier, the most effective products found anywhere in the world. During the past 5 years, ARDEC has received many prestigious national awards for its commitment to service, including the Presidential Award for Quality, two Army Community of Excellence Awards, and several Army Research and Development Organization of the Year Awards.

## ARDEC's Transformation Role

ARDEC's efforts are focused on the following 10 major business areas: smart munitions, indirect fire, direct fire, soldier weapons, mines and demolitions, gun propulsion, fuzing and lethal mechanisms, fire control, munitions survivability, and pollution prevention. Typical ARDEC programs exist in each the following phases of the acquisition process: technology base, production, system design and development, and fielded items. With 2,800 associates chiefly situated at 5 different locations throughout the United States, ARDEC employs a talented cadre of scientists, engineers, technicians,

and other professionals. This nationally recognized team has focused on the Army Chief of Staff's vision of transforming the Army into a rapidly deployable, agile, versatile, lethal, survivable, and sustainable force.

ARDEC and its Picatinny-based customers are expected to be pre-eminent providers of life-cycle lethality research, technology development, engineering, and sustainment throughout the transformation period. Their presence is evident in the near-term Interim Force developments and fieldings that are helping the Army achieve a more deployable combat vehicle force. Armaments like the 105mm main gun for

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the Mobile Gun System and the 120mm mortar system and its current munitions are just a few of Picatinny's commodities that form part of the Interim Force, the U.S. Army's first major step in the transformation process.

ARDEC's accomplishments during the past 5 years include advancement of key armament technologies, type classification of 78 items, and materiel release of 85 others that provided key systems to our fighting forces. Technology advances include nonlethal munitions, a demolition kit for Special Operations Forces, new high-explosive cartridges for the 81mm mortar system, modular artillery propelling charges, a multi-option artillery fuze, electronic time fuzing, insensitive propellants and explosives, and other armaments and munitions.

ARDEC is currently executing 54 advanced technology projects, 61 active small business innovative research projects, 60 products in design and development, 168 products supported in production, 1,386 products supported in the field, and 62 active cooperative research and development agreements with industry. In addition, the center provides simulations, modeling, virtual prototyping, advanced scientific computing, and a wide range of sophisticated engineering services. Among the major programs that ARDEC supports are the Multi-Role Armament System for the Future Combat Systems, objective crew-served weapons and objective individual combat weapons, multi-purpose anti-tank projectiles, advanced explosively formed penetrators, and kinetic energy warheads.

ARDEC's state-of-the-art facilities include the Armament Technology Facility, which brings together small- and cannon-caliber armament system design and validation and testing of the latest technolo-

gies. In addition, the Advanced Warhead Development Facility tests and evaluates shaped charge and explosively formed penetrator warheads in a completely contained and highly instrumented environment. Further, its Armaments Software Engineering Center is a life-cycle software engineering center for armament platform and weapon digitization efforts.

### **Developing Weapons For Homeland Security**

Many of the technologies developed by ARDEC support the Army's warfighting capabilities and will be adapted for homeland security needs. Infrared, acoustic, and radar sensors—used singly or in combination—can provide intrusion detection and perimeter security. Multi-spectral X-ray technology can facilitate real-time inspection of baggage and small crates at security checkpoints. Hyperspectral infrared imaging can detect chemical and biological agents, while Picatinny's improved nonlethal munitions can increase security perimeters by stopping threats at a greater range and incapacitating antagonists if required. High value targets can be protected by layered defenses incorporating acoustic cannons and hypersonic sound devices, while smart audio and video surveillance systems can more effectively control crowds and yield intelligence about hostile threats.

### **Conclusion**

In the future, guns and munitions will continue to become smaller, smarter, and more affordable. In fact, ARDEC is exploring new novel propulsion technologies that enable guns to be more readily integrated on very small robotic platforms weighing less than 6 tons as well as on unmanned aerial vehicles.

ARDEC's mission continues to expand. Thus, it will continue to play a significant role in shaping the future of armaments, particularly as tactical advanced energy weapons systems evolve. Many of these systems are based on directed energy technologies like lasers, high-powered microwaves, acoustics, electronic beams, and plasmas. ARDEC has strong, established partnerships with DOD, the Department of Energy (DOE), and academia, each of which is exploring these same advanced technologies. In partnership with DOE and the Army Research Laboratory, ARDEC is establishing the path that leads to the 2005 to 2015 timeframe for evaluation, development, and fielding of these technologies and their potential application.

In this way, ARDEC continues to accomplish its vision while providing the advanced technologies needed to maintain peace and, if necessary, to defend America at home and throughout the world.

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