



2019 Secretary of Defense Environmental Awards Environmental Excellence in Weapon System Acquisition, Small Program Award

Each year since 1962, the Secretary of Defense (SecDef) has honored installations, teams, and individuals for outstanding conservation achievements, innovative environmental practices, and partnerships that improve quality of life and promote efficiencies without compromising the Department of Defense's (DoD's) mission success. The 2019 SecDef Environmental Awards cycle encompasses an achievement period from October 1, 2016 through September 30, 2018 (Fiscal Years (FY) 2017-2018). A diverse panel of 58 judges with relevant expertise representing Federal and state agencies, academia, and the private sector evaluated all nominees to select one winner for each of the nine categories that cover six subject areas: natural resources conservation, environmental quality, sustainability, environmental restoration, cultural resources management, and environmental excellence in weapon system acquisition.

About the Environmental Excellence in Weapon System Acquisition, Small Program Award

The Environmental Excellence in Weapon System Acquisition, Small Program award recognizes efforts to incorporate environment, safety, and occupational health requirements into a small (Acquisition Category II or III) weapon system acquisition program's system engineering, contracting, and decision-making processes. Adhering to these principles enhances DoD's acquisition process by ensuring that weapon system programs prioritize the safety of personnel and protection of the environment. The 2019 winner of the Environmental Excellence in Weapon System Acquisition, Small Program award is the *Tagnite Technical Working Group, U.S. Army Research Laboratory, Aberdeen Proving Ground, Maryland*.

About the Tagnite Technical Working Group, U.S. Army Research Laboratory, Aberdeen Proving Ground, Maryland

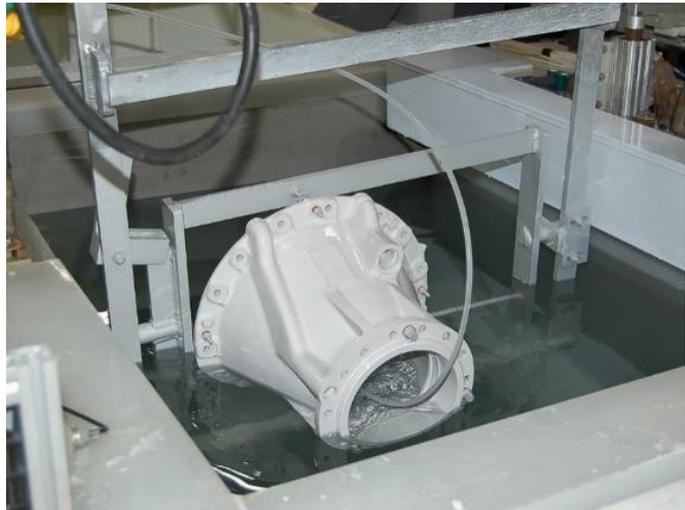
The U.S. Army Research Laboratory (ARL) is the Army's corporate research laboratory headquartered at the Adelphi Laboratory Center in Adelphi, MD. The ARL is tasked with discovering, innovating, and transitioning science and technology to ensure dominant strategic land power. The ARL led the joint Tagnite Technical Working Group (WG) among various Army Commands based out of ARL's largest single site, Aberdeen Proving Ground, MD. The Tagnite Technical WG successfully developed and demonstrated a manufacturing capability at Corpus Christi Army Depot (CCAD). The CCAD provides overhaul, repair, modification, recapitalization, retrofit, testing, and modernization of helicopters, engines, and components for all Military Service and international sales of rotary wing aircraft. This Tagnite anodizing capability replaces older surface treatment methods that required the use of hexavalent chromium, a human carcinogen, and allows the immersion and brush application of Tagnite anodizing to legacy magnesium components. The Tagnite Technical WG's development of a more environmentally sustainable and safer manufacturing capability at CCAD will help ensure the continued safety and readiness of Servicemen and women across the Army and DoD Components.



The Tagnite Technical Working Group team, plating shop personnel and stakeholders. Pictured from left to right: Meghan McGinley, Braxton Lewis, Luke Kingsbury, Earl Woolsey, Kyu Cho, Bob Olson, Nestor Villarreal, Bill Gorman, Meghan Clardy, Aaron Hoss. Not pictured are Scott Howison, Mark Feathers, and Anne Crago.

Major Accomplishments in FY 2017-2018

- The Tagnite Technical WG developed and demonstrated a magnesium weapon system component manufacturing capability at CCAD using both Tagnite anodizing immersion and brush application. This method reduces exposure to hexavalent chromium, a human carcinogen, and provides a more durable and corrosion resistant surface compared to traditional finishes. The next step is to scale the pilot process line to full-production capability, which can extend the service lives of magnesium components and make repairs possible on parts that otherwise would be unserviceable. Switching to Tagnite anodizing is projected to save the Apache H-64 Helicopter program nearly \$1.2 million per year through FY24.
- The working group's Tagnite anodizing process alleviates future regulatory challenges that could restrict current maintenance practices and impact aircraft readiness. Domestic and international regulators are increasingly targeting hexavalent chromium, so incorporating hexavalent chromium-free technology into magnesium part repairs helps avoid obsolescence associated with increased regulation.
- The Tagnite Technical WG developed a stripping technique to remove current coatings and remain compatible with Tagnite re-anodizing. This technique uses sodium bicarbonate blasting, where the blast material is soluble in water and prevents fluid passageway blockages.
- Tagnite anodizing reacts violently with ferrous metals sometimes found on machine parts. To address this problem, the Tagnite Technical WG developed and demonstrated the use of novel aluminum masking agents to protect dissimilar metal components during the Tagnite application, and applied them to two dozen parts.
- The Tagnite Technical WG trained local CCAD plating shop personnel to apply both Tagnite anodizing immersion and brush application techniques. This training facilitates the expansion of the pilot-scale process line and ensures that CCAD personnel apply the most durable and effective coating possible.



The Tagnite anodizing immersion application developed by the Tagnite Technical Working Group reduces exposure to carcinogenic hexavalent chromium. The capability extends the life of magnesium components and alleviates regulatory challenges.



The Tagnite Technical Working Group developed a sodium bicarbonate blasting technique to remove current coatings and keep components compatible with Tagnite re-anodizing. This technique is soluble in water and prevents fluid passageway blockages.