



2017 Secretary of Defense Environmental Awards Environmental Excellence in Weapon System Acquisition, Small Program Award

Each year since 1962, the Department of Defense (DoD) 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 mission success. The 2017 Secretary of Defense Environmental Awards cycle encompasses an achievement period from October 1, 2014, through September 30, 2016 (Fiscal Years (FY) 2015-2016). A diverse panel of 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 requirements enhances DoD's acquisition process by ensuring that weapon system programs keep the safety of personnel and protection of the environment as a priority. The 2017 winner of the Environmental Excellence in Weapon System Acquisition, Small Program award is the *Chromium-Free Wash Primer Replacement Team, U.S. Army Research Laboratory, Maryland*.

About the Chromium-Free Wash Primer Replacement Team, U.S. Army Research Laboratory, Maryland

The U.S. Army Research Laboratory (ARL) is the Army's corporate laboratory tasked with discovering, innovating, and transitioning science and technology to ensure dominant strategic land power. The ARL Chromium-Free Wash Primer Replacement Team executes this mission by promoting alternatives to the use of hazardous hexavalent chromium (Cr(VI)). The Army relies on carcinogenic Cr(VI) compounds like DOD-P-15328 wash primer to protect its weapon systems from corrosion. The DOD-P-15328 wash primer constitutes one of the largest sources of Cr(VI) in Army operations because it is the primary surface treatment required for mixed metal applications. Workers and Soldiers may be exposed to Cr(VI) compounds during spray application of wash primer and during routine maintenance throughout the life cycle of systems treated with wash primer. As a secondary environmental concern, DOD-P-15328 wash primer contains high amounts of volatile organic compounds (VOCs), which contribute to poor air quality and increase human health risks. The team executed a project to develop, demonstrate, and implement low-VOC, Cr(VI)-free pretreatments as alternatives to wash primer.



The Chromium-Free Wash Primer Replacement Team (from left to right: Thomas Considine, Fred Lafferman, Jack Kelley, Alicia Farrell, Thomas Braswell; not pictured: Thomas Stagg).

Major Accomplishments in FY 2015-2016

- The Chromium-Free Wash Primer Replacement Team identified three Cr(VI)-free pretreatments for mixed metal substrates that meet TT-C-490F Type III Federal environmental standards. This paved the way to remove DOD-P-15328 wash primer from the Chemical Agent Resistant Coating system and eliminate its use on Army weapon systems.
- ARL staff selected the best performing wash primer alternative and tested the alternative, Henkel's Bonderite 7400, on support trailers at Letterkenny Army Depot. The Army deployed the support trailers and they remain in service.
- ARL personnel provided three qualified alternatives to the U.S. Army Public Health Center (APHC): Henkel's Bonderite 7400 (manganese and fluoride-based), Chemetall's Oxsilan 9810/2 (zirconium silane-based), and PPG's 11-TGL-07-Z (zirconium-based). The APHC published toxicology assessments in January 2016 and verified that these alternatives did not pose other serious environmental risks that would prevent implementing the alternatives. The APHC concluded that the recommended alternatives are preferable to the DOD-P-15328 wash primer.
- The Chromium-Free Wash Primer Replacement Team contributed to efforts that will reduce 24,000 pounds of Cr(VI) compounds and 2.3 million pounds of VOCs per year. More specifically, these efforts will reduce 58 percent of all Cr(VI) usage at Letterkenny Army Depot (610 pounds) annually.
- ARL issued a memorandum announcing the cancellation of DOD-P-15328. ARL intends to cancel the specification no later than September 30, 2017, giving users one year to transition their wash primer usage to qualified Cr(VI)-free alternatives.
- The team is transitioning alternatives to additional government and contractor users that have expressed interest in Cr(VI)-free pretreatments. Interested users include Anniston, Red River, and Sierra Army Depots, the U.S. Marine Corps, and multiple original equipment manufacturers.



The Chromium-Free Wash Primer Replacement Team applies hexavalent chromium-free alternatives to DOD-P-15328 wash primer to metal coupons in preparation for performance testing.



A generator trailer pretreated with Henkel's Bonderite 7400, an alternative to DOD-P-15328 wash primer, and Chemical Agent Resistant Coating topcoat completed outdoor weathering at Letterkenny Army Depot. The U.S. Army Research Laboratory intends to cancel DOD-P-15328 now that three low volatile organic compounds, hexavalent chromium-free alternatives have been approved to TT-C-490 Federal specifications. Alternative pretreatments will reduce the emission of 2.4 million pounds of volatile organic compounds to the atmosphere per year.