

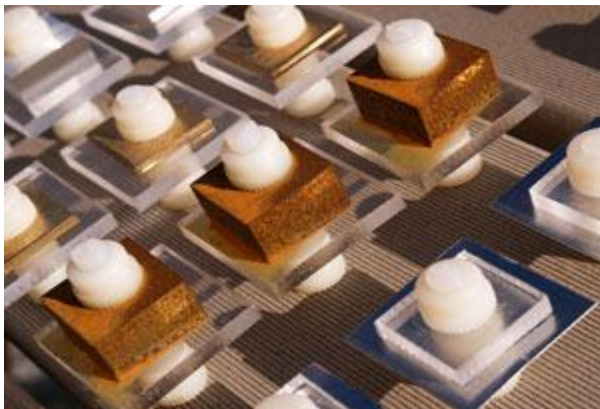
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Top Story

## A New Way to Fight Corrosion—Partner with the DoD!

### *Corrosion Problems in Industry Resemble Those in the Military*

*By Chris Grethlein*

The principal goal of DoD's Office of Corrosion Policy and Oversight is to minimize the impact of corrosion on the nation's military assets to increase readiness, decrease costs, and improve the safety of all weapons platforms and infrastructure. But beyond this fundamental charge, the Corrosion Office and its partners seek to bring these advances to the commercial sector.



*The military and industry are similarly impacted by the effects of corrosion, as manifested on this series of fastener coupons on ARDEC's environmental exposure rack. Photo courtesy of the Army's Armament Research, Development, and Engineering Center (ARDEC).*

Private companies share many of the same challenges as DoD in protecting their products and capital equipment. But organizations could potentially improve their bottom line by taking advantage of government laboratories' and product centers' experience with corrosion issues.

The U.S. Army's Armament Research, Development, and Engineering Center (ARDEC) at the Picatinny Arsenal in New Jersey is one such center. ARDEC has a long history of partnering with industry, universities, and non-military government agencies throughout the research, development, production, and fielding of advanced armaments for the soldier.

"We're seeking new partners to expand our horizons," said Daniel P. Schmidt, senior materials engineer at ARDEC.

universities. Its range of laboratories, test facilities, and technology centers offers partners and customers access to the state of the art in a broad spectrum of technologies. As part of this overall thrust, the ARDEC Corrosion Office and its extensive test facility have been working for and with government agencies and commercial enterprises.

### **Corrosion Testing Facility Addresses Myriad Corrosion Issues**

ARDEC's Corrosion Testing Facility is a fully functional engineering laboratory, capable of conducting a wide variety of tests and analyses to assess and characterize the many forms of corrosion. Material science, manufacturing processes, virtual reality and simulation, image processing, and non-destructive testing are just a few of the capabilities available to the private sector through ARDEC. The facility's specific capabilities include:

- Corrosion Instrumented Test Yard (CITY)—The ARDEC Corrosion Office maintains an atmospheric exposure test site called the CITY for test coupons and some components. One of the more realistic forms of corrosion testing,

CITY allows ARDEC and its partners to conduct long-term corrosion studies in accordance with ASTM G50, "Standard Practice for Conducting Atmospheric Corrosion Tests on Metals."

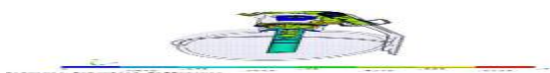
- The test yard has a continuous weather logging capability, so that cumulative exposure can be quantitatively assessed for individual tests. Last, the test yard offers a safe and secure test venue for partners, since it is located on a military installation and is accessible only to authorized parties.
- Electrochemical Laboratory—Knowing that bench testing can be as important as exposure testing, the ARDEC Corrosion Office offers quantitative capabilities in electrochemical testing, featuring a full range of equipment—potentiostats, galvanostats, zero-resistance ammeters, software analyses, and test cells—capable of running numerous electrochemical tests in the laboratory as well as in the field.
- Specialized Testing Equipment—The Corrosion Testing Facility can also perform tests in simulated environments, measuring a number of physical properties. Central to this is a multi-function environmental chamber capable of creating salt fog, high temperature, and high-humidity environments for cyclic corrosion testing. Other measurement tools include a xenon arc chamber, gravelometer, contact angle meter, scratch tester, and hydraulic adhesion test equipment.
- Metallurgical Test Laboratory—The ARDEC Corrosion Office also has an on-site facility for metallurgical analyses. The lab can conduct a number of analytical techniques for metallographic, compositional, and failure of metal specimens. Metallographic analyses can be performed on samples via scanning electron, 3-D digital, or optical microscopy.



ARDEC offers a wide variety of corrosion test apparatus, such as the Corrosion Instrumented Test Yard (CITY). Photo courtesy of ARDEC.

### Partnering with Industry

ARDEC's Corrosion Testing Facility can offer industrial partners a chance to participate in joint test protocols, benefitting both the DoD and participating companies. ARDEC has a public/private partnering focus to build joint programs that leverage both defense and commercial investment and technology. "One example is the Defense Ordnance Technology Center or DOTC, which is a collaboration of world-class technologists, facilities, and expertise operating in an integrated consortium of industry, academia, and DoD agencies," Schmidt said. "The DOTC fosters partnering throughout the life cycle from basic research to manufacturing and demilitarization."



ARDEC works with an industrial partner to develop a galvanic corrosion software module, pictured in this drawing. Photo courtesy of ARDEC.

effective oil drilling technologies," Schmidt said.

Although ARDEC's principal mission is oriented toward mature technologies for armaments applications, it also looks for ways to transfer beneficial technologies to public use, corrosion preventative technologies being no exception. "We've transferred technologies to the law enforcement community for purposes such as crowd control and forcible entry devices, as well as to the oil and gas industry to develop more

ARDEC's manufacturing technology program transfers a variety of technologies to U.S. industry, such as model-based control and environmentally safer manufacturing methods. Companies may partner with ARDEC and other federal labs through a test services agreement, in which the lab has expertise, and the company pays personnel to conduct testing. Alternatively, individual companies may enter into collaborative research and development agreements, in which companies working on technologies of interest, serve a near-term need, or an identified military need. Under this type of agreement, both the company and its government partner put forth resources, collaborating and sharing in the results. At present, ARDEC has more than 80 such agreements in place with its industrial partners.

ARDEC also offers numerous contracting opportunities for small businesses, either as partners or contractors. Picatinny Arsenal is canvassing industry to develop a comprehensive listing of Small- and Small Disadvantaged Businesses, HUBZone Businesses, Women-owned Small Businesses, and Service-Disabled Veteran-owned Small Businesses, for example. Companies wishing to participate in this canvassing initiative may do so online by accessing <http://www.pica.army.mil/smallbusinessprogram/CanvasDoc.aspx>.

To learn more about how small companies may do business with the Army, access <http://www.pica.army.mil/smallbusinessprogram/>.