US Army Corps of Engineers®
Engineer Research and Development Center

Paint Technology Center

Purpose

The primary mission of the Paint Technology Center (PTC) is to support the painting of the military infrastructure at Army and other DoD installations.

Specifications

The PTC, located at the Construction Engineering Research Laboratory (CERL), Champaign, IL, maintains an extensive array of laboratory equipment, ranging from the common tools and supplies needed to perform routine paint testing, to sophisticated electronic instrumentation required to perform research and development, and forensic-type studies. The facility's various test configurations can determine the performance of paints and coatings under normal to harsh natural conditions.

The PTC's weathering equipment, for example, gauges paint performance over the long term. Outdoor paint weathering racks test paint performance (using painted and "scribed" experimental coupons) under normal environmental stress. Some of the paint samples pictured below show 10+ years of wear. Salt- and fresh-water immersion tanks simulate paint wear in aquatic environments common in Corps of Engineers' Civil Works structures (e.g., locks and dams). Some samples housed in this equipment show paint weathering under 20+ years of severe-environmental stresses. The Center's saltwater/heat prohesion cabinet and ultraviolet exposure equipment create an accelerated-wear environment for more rapid stress testing.

The PTC keeps a stock of raw materials and milling equipment to manufacture laboratory batches of paint, and gauges and meters required for field evaluation of coatings. The Center's relationship with the Steel Structures Painting Council, American Society for Testing and Materials, Tri-Services Paint Committee, National Association of Corrosion Engineers, and the University of Illinois helps further broaden its equipment and technology base to address the full range of needs in the field of painting technology.

Benefits

PTC facilities are made available on a reimbursable basis to Army, other government, and non-government interests. The PTC's unique collection of equipment and supplies, combined with the knowledge and experience of staff researchers, enables the facility to develop paints for specialized uses demanded by Corps applications and external customers.

These outdoor paint-weathering racks have exposed painted metal samples to ambient environmental stresses for 10+ years.

Success Stories

Private industry developed and patented the technology for making the first coal tar epoxy in the early 1960s. Energy shortages of the early to mid 1970s resulted in short supplies of the special coal tar pitch. The Corps of Engineers, in cooperation with Society for Protective Coatings (SSPC) conducted additional research to develop a product based on a more available grade of pitch. Researchers used the facilities at the PTC to develop and test a

compliant coal tar epoxy product now used on virtually all salt water gates, sheet pilings, and buried structures throughout the Corps of Engineers.

Recently the U.S. Army Corps of Engineers (USACE) authorized work to test commercially available, high performance paints for use on navigation and other hydraulic structures. The Center's short-term bench tests on liquid materials and long-term exposure testing in seas-salt, freshwater, atmospheric, and accelerated weathering conditions showed significant performance differences among similar products from alternate manufacturers.

ERDC POC(s)

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(Top-left to bottom right) The PTC's "falling sand" machine creates specialized wear conditions. Fresh-water immersion tanks, condensation tester, saltwater/heat prohesion cabinet, and saltwater immersion baths simulate natural stresses. (Some of these saltwater-immersed samples show stresses of 20+ years of immersion.) The PTC maintains a complete inventory of test chemicals and hardware.