

Trivalent Chromium Processes

Department of Defense
Naval Air Warfare Center
Aircraft Division Patuxent River

A team from the Naval Air Warfare Center Aircraft Division (NAWCAD) has developed and commercialized an innovative metal surface coating containing trivalent chromium sulfate that protects against corrosive environments. This marks a significant improvement over the widely used traditional, but toxic, hexavalent chromium process. The novel breakthrough chemical solution minimizes the corrosion of aluminum, zinc, and other substrates while it improves the bonding surface for paints.

Easy to apply and price-competitive, these trivalent chromium processes (TCP) also provide chemical and weather resistance to treated surfaces. The technology meets the more demanding EPA and OSHA requirements recently implemented in response to concerns over use of the highly toxic hexavalent chromium. TCP is the first protective chromium-based metal coating to fully meet U.S. military specifications while being both highly effective and environmentally benign. It also is the only non-hexavalent chromium conversion coating that satisfies military specifications for pre- and post-treatment of aluminum surfaces. Initially developed to better protect military aircraft and watercraft, TCP technology has vast market potential in the private sector within the ubiquitous metal-coating industry. Under nonexclusive patent license agreements with several companies,



From left: Craig Matzdorf, James Green, Michael Kane, RDML Jeffrey Wieringa

NAWCAD has successfully transferred this important advance in metal finishing to widespread civilian use.

Currently, four licensees are in various stages of marketing TCP to consumers in the United States, Canada, and Mexico: Luster-On Products, Inc., of Springfield, Massachusetts; Metalast International, Inc., of Minden, Nevada; SurTec International GmbH, of Zwingenberg, Germany; and Henkel Surface Technologies Corp., of Madison Heights, Michigan. Given the extent of metal fabrication and utilization around the world, the market possibilities for TCP applications are immense, affecting our daily lives from the commercial airline industry to home construction.

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