



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
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From: Head, Materials Engineering Division, Air Vehicle Engineering Department, Naval Air Systems Command (AIR-4.3.4)

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Subj: NAVAL AIR SYSTEMS COMMAND AUTHORIZATION FOR ALUMIPLATE

Ref: (a) MIL-DTL-83488: Coating, Aluminum, High Purity

(b) Brown, Steven A., Cadmium Alternative Coating Corrosion Performance on Steel, SERDP/ESTCP Sustainment Workshop, February 26-28, 2008

(c) Lee, Eun, et al, Cadmium Alternative Coating Performance on 4340 Steel, 2007 Tri-Service Corrosion Conference

(d) Schwartz, Andy, et al, Corrosion Performance of AlumiPlate Coated Electrical Connectors with Trivalent Chromium Post Treatment, Joint Services Cadmium Alternatives Team Meeting, January 24, 2007

(e) Sikorsky Engineering Report, SER 704129: Dynamic Components Study Phase III (AlumiPlate Coating) Volume 1: Torque-Tension, Adhesion, and Thermal Stability Test Results, 23 July 2008

(f) Sikorsky Engineering Report, SER 704129: Dynamic Components Study Phase III (AlumiPlate Coating) Volume 2: Galvanic Corrosion Performance for Coated Steel Bushings in Aluminum and Magnesium Substrates, 15 August 2008

(g) Sikorsky Engineering Report, SER 704129: Dynamic Components Study Phase III (AlumiPlate Coating) Volume 3: Fatigue and Hydrogen Embrittlement Test Results, 10 October 2008

(h) Environmentally Compliant Processes for Landing Gear, SAE Aerospace, Aerospace Information Report, SAE AIR 5479revA, July 2007

(i) Process Overview for AlumiPlate, July 22, 2008

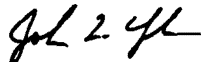
(j) Plating and IVD Aluminum Workload Data for FRC Southeast, June 25, 2008

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1. AlumiPlate is a highly-dense, pure aluminum coating produced by a proprietary, non-aqueous, electrolytic immersion process. This coating conforms to reference (a) and is an environmentally-preferred candidate to replace cadmium coatings used for corrosion protection on steel components. It is also an acceptable alternative to other cadmium replacement technologies like Ion-Vapor Deposited (IVD) aluminum and alloys of zinc-nickel and tin-zinc, offering better resistance to corrosion.
2. References (b-h) contain the laboratory assessment results for AlumiPlate compared to sacrificial coatings of electroplated cadmium, IVD aluminum and other alternative coatings currently in use on Navy and Marine Corps aviation systems. Results show that AlumiPlate performs similarly to electroplated cadmium and better than IVD aluminum and electroplated zinc-nickel alloys, when tested as-plated and with qualified primer and topcoat finishing systems. Reference (i) details AlumiPlate Inc.'s proprietary process that was used to deposit the coating used in the testing described in references (a-g).
3. Reference (j) contains a list of components which were coated with either cadmium or IVD aluminum during 2006 and 2007 at FRC Southeast. IVD aluminum coatings have been used on high-strength steel components by FRC-Southeast, FRC East, and FRC-West since 1987. These facilities have refurbished in excess of 10,000 components over 20 years with no known component failures due to the use of IVD aluminum.
4. Based on laboratory performance data for AlumiPlate and IVD aluminum's successful 22-year service record on high-strength steel components, this Command authorizes the use of AlumiPlate coatings conforming to reference (a) and deposited IAW reference (i) in applications currently using either electroplated or vacuum-deposited cadmium or IVD aluminum. These coatings are authorized for use only in combination with MIL-PRF-81706 Type I or Type II Class 1A conversion coatings and chromate primers per MIL-PRF-23377 Class C1 or C2 or MIL-PRF-85582 Class C1 or C2. A topcoat qualified to MIL-PRF-85285 is recommended for all applications to maximize corrosion resistance.
5. Implementation of AlumiPlate on specific systems or items must be executed through the cognizant engineering authority using the appropriate engineering change process. At this time, AlumiPlate is not authorized for bulk unpainted applications, like electrical connectors and fasteners, or any other applications not specifically addressed here.

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6. The NAVAIR points-of-contact for this issue are Mr. Craig Matzdorf, NAVAIR Patuxent River, MD, ph: (301) 342-9372; Mr. Bill Nickerson, NAVAIR Patuxent River, MD, ph: (301) 342-8864; Mr. Jack Benfer, FRC Southeast Jacksonville, FL, ph: (904) 542-4516 x153; Mr. James Whitfield, FRC East, Cherry Point, NC, ph: (252) 464-7342; Mr. Robert Kestler, FRC East, Cherry Point, NC, ph: (252) 464-9888; Mr. Chris Eveland, FRC Southwest, North Island, CA, ph: (619) 545-9758.


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