



Standard Specification for Chromates on Aluminum¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers the requirements relating to rinsed and nonrinsed chromate conversion coatings on aluminum and aluminum alloys intended to give protection against corrosion and as a base for other coatings. This edition of the specification has been coordinated with ISO 10546 and is technically equivalent.

1.2 Aluminum and aluminum alloys are chromate coated in order to retard corrosion; as a base for organic films including paints, plastics, and adhesives; and as a protective coating having a low electrical contact impedance.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- B 117 Practice for Operating Salt Spray (Fog) Apparatus
 - B 602 Test Method for Attribute Sampling of Metallic and Inorganic Coatings
 - B 767 Guide for Determining Mass Per Unit Area of Electrodeposited and Related Coatings by Gravimetric and Other Chemical Analysis Procedures
 - D 1730 Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting
 - D 3359 Test Methods for Measuring Adhesion by Tape Test
- #### 2.2 ISO Standards:
- ISO 2409 Paint and Varnishes—Cross-Cut Test³
 - ISO 3768 Metallic Coatings—Neutral Salt Spray Test (NSS Test)³

ISO 3892 Conversion Coatings on Metallic Materials—Determination of Mass Per Unit Area—Gravimetric Method³

ISO 4519 Electrodeposited Metallic Coatings and Related Finishes—Sampling Procedures for Inspection by Attributes³

ISO/ DIS 10546 Chemical Conversion Coatings—Rinsed and Nonrinsed Chromate Conversion Coatings—On Aluminum and Aluminum Alloys³

2.3 Federal Standard:

Fed. Std. No. 141 Paints, Varnish, Lacquer, and Related Materials; Methods of Inspection⁴

2.4 Military Specification:

MIL-C-5541 Chemical Films for Aluminum and Aluminum Alloys⁴

3. Terminology

3.1 Definitions:

3.1.1 *nonrinsed*—chromate coatings that are dried immediately after the chromating step without receiving a water rinse.

3.1.1.1 *Discussion*—This special type of coating is typically used on long coils of aluminum sheet stock that receive an immediate subsequent paint or adhesive coating.

NOTE 1—Nonrinsed chromate coatings are finding increased usage on fabricated parts and castings.

3.1.2 *rinsed*—chromate coatings that are rinsed in water prior to drying.

3.1.2.1 *Discussion*—This type of coating is typically applied to extruded aluminum fabricated parts and castings.

4. Classification

4.1 Chromate finishes can be applied ranging in color from brown, thick coatings (Class 1) providing maximum corrosion protection to yellow, intermediate thickness coatings (Class 2) suitable as an organic film base or to colorless, thin coatings (Class 3) suitable for low electrical contact resistance. The yellow coatings vary from golden yellow to iridescent light yellow. Chromate-phosphate finishes (Class 4) can be applied

¹ This specification is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.07 on Chemical Conversion Coatings.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098