



Standard Specification for Non-hexavalent Chromium Conversion Coatings on Aluminum and Aluminum Alloys¹

This standard is issued under the fixed designation B 921; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers the requirements relating to rinsed and non-rinsed non-hexavalent chromium conversion coatings on aluminum and aluminum alloys intended to give protection against corrosion and as a base for other coatings.

1.2 Aluminum and aluminum alloys are conversion 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 requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

B 117 Practice for Operating Salt Spray (Fog) Apparatus²

B 602 Test Method for Attribute Sampling of Metallic and Inorganic Coatings³

D 1730 Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting³

D 3359 Test Methods for Measuring Adhesion by Tape Test⁴

2.2 ISO Standards:

ISO 2409 Paint and Varnishes—Cross-Cut Test⁵

ISO 3768 Metallic Coatings—Neutral Salt Spray Test (NSS Test)⁵

ISO 4519 Electrodeposited Metallic Coatings and Related Finishes—Sampling Procedures for Inspection by Attributes⁵

2.3 Federal Standard:

Fed. Std. No. 141 Paints, Varnish, Lacquer, and Related

Materials; Methods of Inspection⁶

2.4 Military Specification:

MIL-C-5541 Chemical Films for Aluminum and Aluminum Alloys⁶

3. Terminology

3.1 Definitions:

3.1.1 *non-rinsed*—conversion coatings that are dried immediately after the conversion coating 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—Non-rinsed conversion coatings are finding increased usage on fabricated parts and castings.

3.1.2 *rinsed*—conversion 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 A class one conversion coating provides for maximum salt fog corrosion protection to bare metal. A class two conversion coating is designed to give painted salt fog corrosion resistance and some bare salt fog corrosion resistance. A class three conversion coating provides little salt fog corrosion resistance, but low electrical contact resistance (see MIL-C-5541). Class four and five conversion coatings only provide for painted salt fog corrosion resistance.

4.2 The finishes are divided into four classes; their most important characteristics are listed in Table 1.

5. Surfaces Preparation

5.1 The surfaces of the parts to be conversion coated shall be clean and free of any oxidation, scale, or soils such as metal turnings, grinding dust, oil, grease, lubricants, hand-sweat, or any other contamination detrimental to the conversion coating process. The parts shall therefore, as far as necessary, be

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 Chromate Conversion Coatings.

Current edition approved Sept. 10, 2002. Published November 2002.

² *Annual Book of ASTM Standards*, Vol 03.02.

³ *Annual Book of ASTM Standards*, Vol 02.05.

⁴ *Annual Book of ASTM Standards*, Vol 06.01.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁶ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.