



Standard Guide for Conducting Exfoliation Corrosion Tests in Aluminum Alloys¹

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1. Scope

1.1 This guide differs from the usual ASTM standard in that it does not address a specific test. Rather, it is an introductory guide for new users of other standard exfoliation test methods, (see Terminology [G15](#) for definition of exfoliation).

1.2 This guide covers aspects of specimen preparation, exposure, inspection, and evaluation for conducting exfoliation tests on aluminum alloys in both laboratory accelerated environments and in natural, outdoor atmospheres. The intent is to clarify any gaps in existent test methods.

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

1.4 *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

[G1 Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens](#)

[G15 Terminology Relating to Corrosion and Corrosion Testing](#) (Withdrawn 2010)³

[G34 Test Method for Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys \(EXCO Test\)](#)

[G50 Practice for Conducting Atmospheric Corrosion Tests on Metals](#)

[G66 Test Method for Visual Assessment of Exfoliation Corrosion Susceptibility of 5XXX Series Aluminum Alloys \(ASSET Test\)](#)

¹ This guide is under the jurisdiction of ASTM Committee G01 on Corrosion of Metals and is the direct responsibility of Subcommittee G01.05 on Laboratory Corrosion Tests.

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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 The last approved version of this historical standard is referenced on www.astm.org.

[G85 Practice for Modified Salt Spray \(Fog\) Testing](#)

[G92 Practice for Characterization of Atmospheric Test Sites](#)

2.2 ASTM Adjuncts:

Illustrations of Appearance Classifications (6 glossy photos)⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *panel*—a flat, rectangular specimen normally taken with the test surface parallel to the longitudinal and longitudinal-transverse dimensions of fabricated product. For thin sheet and extrusions, the thickness may be the full thickness of the part.

3.1.2 *sample*—a portion of a large piece, or an entire piece out of a group of many pieces, that is submitted for evaluation and considered representative of the larger piece or population. For castings and forgings, this may be an extra portion or prolongation, or in the case of small parts, an entire extra piece taken from a specific lot.

3.1.3 *specimen*—the actual test piece to be corrosion tested. Frequently this has a specific shape with prescribed dimensional tolerances and finishes.

3.1.4 *test plane*—the plane in the thickness of the sample that is being tested. Generally this is the fabricated surface or some specified interior plane. Interior planes typically used are: (a) T/10 = 10 % of the thickness removed, (this is representative of a minimal machining cut to obtain a flat surface), (b) T/4 = quarter plane, 25 % of the thickness removed, and (c) T/2 = midplane, 50 % of the thickness removed.

4. Significance and Use

4.1 Although there are ASTM test methods for exfoliation testing, they concentrate on specific procedures for test methodology itself. Existent test methods do not discuss material variables that can affect performance. Likewise they do not address the need to establish the suitability of an accelerated test for alloys never previously tested nor the need to correlate results of accelerated tests with tests in outdoor atmospheres and with end use performance.

4.2 This guide is a compilation of the experience of investigators skilled in the art of conducting exfoliation tests and

⁴ Available from ASTM International Headquarters. Order Adjunct No. [ADJG003402](#). Original adjunct produced in 1980.