



Standard Test Method for Accelerated Acid Etch Weathering of Automotive Clearcoats Using a Xenon-Arc Exposure Device¹

This standard is issued under the fixed designation D7356/D7356M; 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 test method covers an accelerated exposure test intended to simulate defects in automotive clearcoats caused by acid rain² that occur at the Jacksonville, Florida exposure site. Exterior exposures at an acid rain test location in Jacksonville, Florida produce etch defects that range from small pits to 12.7 mm [0.5 in.] in diameter or larger acid-etched spots. The latter type of defect is not produced in other acid-etch tests that only produce pits that are smaller than 6.35 mm [0.25 in.] in diameter.³

NOTE 1—Digital images of the acid etch defects produced in outdoor acid-rain exposures and in the accelerated test described in this test method are found in [Appendix X1](#).

1.2 The accelerated test described in this test method uses a xenon-arc light source with daylight filter conforming to the requirements of Practice [G155](#). Specimens are sprayed with a simulated acid rain solution and requires the use of a horizontal, flat specimen array in order to allow the acid rain solution to remain on the test specimens for an extended period of time.

1.3 There is no known ISO equivalent to this test method.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

¹ This test method is under the jurisdiction of ASTM Committee [D01](#) on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee [D01.27](#) on Accelerated Testing.

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² The acid etch test method is covered by a patent. Interested parties are invited to submit information regarding the identification of an alternative(s) to this patented item to ASTM International Headquarters. Your comments will receive careful considerations at a meeting of the responsible technical committee,¹ which you may attend.

³ Brennan, P. J., Marino, M., Boisseau, J. and Campbell, D., Accelerated Acid Etch, Part II: Refined Test Procedure to Reproduce Automotive Acid Etch Provides Improved Lab Practicality and Proven Correlation, FSCT, 2006 FutureCoat Proceedings.

1.5 *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:*⁴

[D1293](#) Test Methods for pH of Water

[D4517](#) Test Method for Low-Level Total Silica in High-Purity Water by Flameless Atomic Absorption Spectroscopy

[G113](#) Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials

[G147](#) Practice for Conditioning and Handling of Nonmetallic Materials for Natural and Artificial Weathering Tests

[G151](#) Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources

[G155](#) Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

3. Terminology

3.1 *Definitions*—Definitions applicable to this standard can be found in Terminology [G113](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *acid rain, n*—cloud or rain droplets containing pollutants, such as oxides of sulfur and nitrogen, to make them acidic.

3.2.2 *acid rain spots, n*—spots are produced when the sun evaporates standing water on the vehicle's surface.

3.2.2.1 *Discussion*—They fall into two categories, mineral deposits and acid-etched spots. Mineral deposits are white calcium spots or salt deposits left on the surface after water evaporates. These deposits can be easily removed with a pre-wax cleaner (polish) or a clay bar. Acid-etched spots are depressions in the paint or clear coat, which cannot be easily removed.

⁴ 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.

*A Summary of Changes section appears at the end of this standard