



Standard Practice for Short Term Vehicle Service Exposure of Automotive Coatings¹

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1. Scope

1.1 This practice provides the protocol for vehicle service exposure testing of automotive coatings. Such exposure testing is valuable for the verification of the performance of automotive coatings and correlation with laboratory test data. Vehicle service exposure is intended to provide short term (2 to 20 weeks) exposure to the stress factors associated with vehicle operation. Factors included are scratch, mar, impact, stone chipping, insect impact, bird dropping, tree sap and staining, environmental fallout, etc.

NOTE 1—Vehicle service exposure is not intended to provide the conditions that are needed for characterizing the long term effects of weathering or corrosion exposure.

1.2 The exposure conditions are produced by the placement of multiple test panels of automotive finishes on automotive test fleets that traverse a defined road course. Exposure to the operating environment can be 20 h/day, 7 days/week allowing for accumulation of over 100 000 miles in 10 weeks of exposure.

1.3 The values stated in SI units are to be regarded as the standard. The values 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:

D 523 Test Method for Specular Gloss²

D 609 Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products²

D 714 Test Method for Evaluating Degree of Blistering of Paint²

D 823 Practices for Producing Films of Uniform Thickness

of Paint, Varnish, and Related Products on Test Panels²
D 1005 Test Methods for Measurement of Dry Film Thickness of Organic Coatings Using Micrometers²
D 1186 Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base²
D 1400 Test Method for Nondestructive Measurement of Dry Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base²
D 3170 Test Method for Chipping Resistance of Coatings³
D 3359 Test Methods for Measuring Adhesion by Tape Test²
D 5767 Test Methods for Instrumental Measurement of Distinctness-of-Image Gloss of Coating Surfaces²
2.2 *U.S. Federal Standard:*
DOT NHTSA Reg. #49 CFR, Part 575⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *blistering*—formation in the film of dome-shaped, liquid- or gas-filled projections resulting from local loss of adhesion and lifting of the film from the previously applied coating or the substrate.

3.1.2 *chipping*—removal of a coating, usually in small pieces, resulting from impact by hard objects or from wear during service.

3.1.3 *cracking*—formation of breaks in a film that extend through to the underlying surface.

3.1.4 *distinctness-of-image-gloss*—aspect of gloss characterized by the sharpness of images of objects produced by reflection at a surface.

3.1.5 *gloss*—angular selectivity of reflectance, involving surface-reflected light, responsible for the degree to which reflected highlights or images of objects may be seen as superimposed on a surface.

3.1.6 *staining*—discoloration, arising from foreign materials, that penetrates into the coating.

4. Significance and Use

4.1 Since the exposure of automotive coatings to the various

¹ This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications, and is the direct responsibility of Subcommittee D01.55 on Factory Applied Coatings on Preformed Products.

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² *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 06.02.

⁴ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.