Designation: D 5894 – 96

Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)[1]

This standard is issued under the fixed designation D 5894; 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 practice covers basic principles and operating practice for cyclic corrosion/UV exposure of paints on metal, using alternating periods of exposure in two different cabinets: a cycling salt fog/dry cabinet, and a fluorescent UV/condensation cabinet.

1.2 This practice is limited to the methods of obtaining, measuring, and controlling exposure conditions, and procedures. It does not specify specimen preparation nor evaluation of results.

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:*

D 610 Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces[2]

D 714 Test Method for Evaluating Degree of Blistering of Paints[3]

D 1654 Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments[3]

D 4587 Practice for Conducting Tests on Paint and Related Coatings and Materials Using a Fluorescent UV-Condensation Light-and-Water Exposure Apparatus[3]

G 53 Practice for Operating Light-and-Water Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials[4]

G 85 Standard Practice for Modified Salt Spray (Fog) Testing[5]

3. Summary of Practice

3.1 The test specimens are exposed to alternating periods of one week in a fluorescent UV/condensation chamber and one week in a cyclic salt fog/dry chamber. The fluorescent UV/condensation cycle is 4-h UV at 60°C and 4-h condensation at 50°C, using UVA-340 lamps. The fog/dry chamber runs a cycle of 1-h fog at ambient temperature and 1-h dry-off at 35°C. The fog electrolyte is a relatively dilute solution, with 0.05 % sodium chloride and 0.35 % ammonium sulfate.

4. Significance and Use

4.1 The outdoor corrosion of painted metals is influenced by many factors, including: corrosive atmospheres, rain, condensed dew, UV light, wet/dry cycling, and temperature cycling. These factors frequently have a synergistic effect on one another. This practice is intended to provide a more realistic simulation of the interaction of these factors than is found in traditional tests with continuous exposure to a static set of corrosive conditions.

4.2 Results obtained from this practice can be used to compare the relative durability of materials subjected to the specific test cycle used.

4.3 No single exposure test can be specified as a complete simulation of actual use conditions in outdoor environments. Results obtained from exposures conducted according to this practice can be considered as representative of actual outdoor exposures only when the degree of rank correlation has been established for the specific materials being tested. The relative durability of materials in actual outdoor service can be very different in different locations because of differences in UV radiation, time of wetness, temperature, pollutants, and other factors. Therefore, even if results from a specific artificial test condition are found to be useful for comparing the relative

[1] This practice is under the jurisdiction of ASTM Committee D-1 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] *Annual Book of ASTM Standards*, Vol 06.02.

[3] *Annual Book of ASTM Standards*, Vol 06.01.

[4] *Annual Book of ASTM Standards*, Vol 14.02.

[5] *Annual Book of ASTM Standards*, Vol 03.02.