Designation: D3310 – 00 (Reapproved 2014)

Standard Test Method for Determining Corrosivity of Adhesive Materials[1]

This standard is issued under the fixed designation D3310; 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 is intended to determine whether an adhesive material, cured or uncured, is corrosive to a metal. It is a general test method intended to screen out those materials that give a visible sign of corrosion.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are provided for information purposes only.

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:*[2]

D907 Terminology of Adhesives

G15 Terminology Relating to Corrosion and Corrosion Testing (Withdrawn 2010)[3]

3. Terminology

3.1 *Definitions:*

3.1.1 Definitions of terms in this test method may be found in Terminologies D907 and G15.

3.1.2 *corrosivity, n*—the tendency to cause corrosion.

4. Summary of Test Method

4.1 The metal of interest is enclosed in a glass container with the adhesive material. The containers are stored in temperature-controlled ovens at various temperatures with and without water present.

4.2 *Controls,* glass jars containing samples (strips) of the same metal with and without water but no adhesive stored in the same oven for comparison.

5. Significance and Use

5.1 This test method is a subjective test in that determinations of degree of corrosivity is based upon a visual inspection for a green discoloration or other evidence of corrosion.

6. Apparatus

6.1 *Glass Jars,* wide-mouth, with screw cap (8-oz size). The cap liner shall be TFE- or FEP-fluorocarbon.

6.2 *Forced Draft Circulating Air Oven,* capable of maintaining 71 ± 2°C (160 ± 4°F); 93 ± 2°C (200 ± 4°F); 121 ± 2°C (250 ± 4°F). Other temperatures can be used with agreement of interested parties.

6.3 *Open Glass Jars or Cups,* 1-oz size.

6.4 *Metal or metals* being checked for corrosion.

7. Procedure

7.1 Place 5 to 10 g of the adhesive in a small glass jar with the metal being evaluated partly embedded in the adhesive. Place this small uncovered jar in a large jar. Screw the cap of the large jar tightly in place. Then place the jar in the oven at a temperature as specified in 6.2.

NOTE 1—Here metal is exposed during cure rather than after cure.

7.2 Same as 7.1, except place a small jar half filled with distilled water in a large jar with the jar containing adhesive and metal. However, do not use water above 71°C.

7.3 Same as 7.1 and 7.2, except cure the adhesive in accordance with manufacturer's instructions before placing it in the large jar.

NOTE 2—Hot-melt or air-dried materials are considered to be in the cured state.

8. Control

8.1 Place a metal specimen similar to the specimen being evaluated in a screw cap jar with no adhesive. Tighten the screw cap in place, and place the jar in the same oven at the same time as the specimen being evaluated. Store another large jar with a control metal specimen and including a small jar with water in it in the oven in a similar manner.

[1] This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of D14.80 on Metal Bonding Adhesives.

Current edition approved March 1, 2014. Published March 2014. Originally approved in 1974. Last previous edition approved in 2006 as D3310 – 00 (2006). DOI: 10.1520/D3310-00R14.

[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.

9. Cleanliness

9.1 Clean the jars and covers so that no foreign matter is present.

9.2 Abrade the metal strips that are exposed with 600-grit mesh emery paper to achieve a shiny surface.

9.3 Expose the metals with corrosion preventive treatments as treated.

10. Observations

10.1 Periodically, make observations of the control and exposed specimens. Note the following information on a scale of five as follows:

10.1.1 (*1*) Exposed sample less tarnished than control,

10.1.2 (*2*) Exposed sample same as control,

10.1.3 (*3*) Exposed sample slightly worse than control,

10.1.4 (*4*) Exposed sample significantly worse than control,

10.1.5 (*5*) Exposed sample badly corroded,

10.1.6 Where possible remove the adhesive so that the corrosive condition in the embedded area may be reported.

11. Report

11.1 Report the following information:

11.1.1 Identification of the adhesive evaluated and cure cycle.

11.1.2 Identification of the metal in detail (that is, specific alloy, temper and special treatment such as cold working, etc).

11.1.3 Description of the condition of test (that is, whether exposure was during cure, after cure and with or without water being present).

11.1.4 Storage time and temperature.

11.1.5 Degree of corrosion on scale of five after convenient intervals. (If corrosion is rapid and severe initial report may be after 1 h. Otherwise, observations may be made and recorded after 1, 3, and 7 days.)

11.1.6 Any unusual aspect of corrosion such as pitting, cracking, and adhesive cure inhibition, etc.

12. Precision and Bias

12.1 Precision and bias statements can not be established, because the test is subjective. The degree of corrosion present on the test specimen is determined by visual comparison to controls, a judgment evaluation. This is not a practical basis for statements of this nature.

13. Keywords

13.1 adhesives; corrosion; corrosivity; moisture; water