



# Standard Test Method for Determination of the Odor of Adhesives<sup>1</sup>

This standard is issued under the fixed designation D4339; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

## 1. Scope

1.1 This test method describes a procedure for evaluating the odor of adhesives. It is intended to replace Federal Standard 175A, Method 4051.

1.2 This test method provides a means of comparing the odor of an adhesive sample to a reference sample. It is not intended to give an absolute value for the odor of a sample. It can be used for wet or dry samples.

1.3 **Warning**—Do not use this test method with adhesives containing hazardous components such as solvent residues and unreacted monomeric materials.

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

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. See 1.3 for specific precautionary statements.*

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

D907 Terminology of Adhesives

D1391 Method for Measurement of Odor in Atmospheres (Dilution Method) (Withdrawn 1986)<sup>3</sup>

## 3. Terminology

3.1 *Definitions*—Several terms in this test method are defined in accordance with Terminology D907.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.10 on Working Properties.

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<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

## 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *odor, n*—that property of a substance which affects the sense of smell.

## 4. Significance and Use

4.1 The results from this determination are useful in determining the suitability of adhesives in applications where the odor level associated with the end use is critical.

## 5. Apparatus

5.1 *Glass Bottles*, 1-qt (1-L), wide-mouth, straight sided, with screw caps.

NOTE 1—It is important that the bottles and caps be kept clean and odor-free. Discard any bottle which cannot be made visibly clean or odor-free. Wash bottles and caps with a suitable cleaning powder, rinse thoroughly with tap water, then rinse with distilled water, drain, and dry in an oven. Do all cleaning in an odor-free atmosphere.

5.2 *Oven or Incubator*, for aging samples at elevated temperatures.

5.3 *Aluminum Foil*.

5.4 *Balance*, capable of measuring to nearest 0.1 g.

## 6. Test Sample and Test Specimen

6.1 Select a test sample representative of the adhesive being tested. It may be liquid or solid. Keep in a tightly closed container until used (5.1).

6.2 For the test specimen, place  $20.0 \pm 0.1$  g of the test sample into the glass bottle (5.1), cover with aluminum foil, place the cap on the bottle and tighten.

NOTE 2—Always use new aluminum foil, never reuse it.

## 7. Reference Sample and Reference Specimen

7.1 Select a reference sample, that from prior experience or knowledge, or by agreement between supplier and purchaser of adhesive, has acceptable odor.

7.1.1 Store the reference sample in a tightly closed container, specified in 5.1, in a reasonably odor-free atmosphere.

7.1.2 Take care against contamination of the reference sample. If it is suspected that the reference sample has been contaminated, discard it and obtain a new reference sample.

7.2 For the reference specimen, transfer  $20.0 \pm 0.1$  g of the reference sample into the glass bottle (5.1), cover with aluminum foil, place the cap on the bottle, and tighten.

## 8. Conditioning

8.1 Age the bottles containing the reference and test adhesive specimens for at least 24 h at ambient temperature and humidity prior to testing.

8.2 If the effect of elevated temperature aging on the odor of the adhesive is desired, place the capped bottles containing the adhesive specimens in an oven at the desired aging temperature, and condition for 2 h. Allow the test specimens to cool to ambient temperature before evaluating odor.

NOTE 3—Bottles aged at elevated temperatures must be shielded within a suitable metal container to protect against bottle rupturing.

NOTE 4—Longer conditioning times may be used, if desired.

8.2.1 Evaluate test specimens aged at elevated temperatures within a 2-h period after test specimens have returned to ambient temperature.

## 9. Selection of Odor Panel

9.1 Use the following criteria for selection of the members of the odor panel:

9.1.1 The panel is to consist of at least three people.

9.1.2 Preferably, panel members are to be nonsmokers.

9.1.3 Panel members are not allowed to smoke, eat, or drink (other than water) for approximately 1 h prior to evaluating samples.

9.1.4 No person with a cold or nasal congestion, or who has been working with chemicals with strong odors, is allowed to be a panel member.

9.1.5 Panel members are to be free of odors from scented cosmetics.

## 10. Procedure

10.1 Pair each adhesive test specimen to be tested with a reference specimen that has undergone identical conditioning.

10.2 Remove the cap and foil and immediately sniff the odor. Keep the bottle closed except for the short period necessary to sniff the specimen. (**Warning**—See 1.3.)

10.3 Indicate for each pair of samples whether the odor of the adhesive specimen is less than, equal to, or greater than the reference specimen.

10.4 Observe the following conditions when conducting the tests:

10.4.1 All panel members are to conduct testing on the same day and within a period of 4 h. See 8.2 for instructions for handling specimens conditioned at elevated temperatures.

10.4.2 Each panel member is to perform the odor testing in a room free of odors and evaluate all specimens in the same room at the same time. All panel members are to use the same room.

NOTE 5—Odor fatigue can occur if many samples are evaluated at one time or if many rechecks are required to reach a decision on the same sample. If this occurs, allow at least 5 min for the nose to regain its former sensitivity. Panel members may find that the sense of smell is sharpened if specimens are rated with the eyes closed.

## 11. Interpretation of Results

11.1 Compile the odor testing results from the panel members. Report the odor level receiving the majority of the votes as the odor level for the test sample.

11.2 If no odor level receives a majority, then rate the test sample as having odor equal to the reference sample.

## 12. Report

12.1 Include in the report the following:

12.1.1 Test sample identification,

12.1.2 Reference sample identification,

12.1.3 Conditioning procedure for test and reference specimens,

12.1.4 Odor of test specimen as less than, equal to, or greater than the odor of the reference specimen, and

12.1.5 Date of evaluation.

## 13. Precision and Bias

13.1 No information is presented about either the precision or bias of Test Method D4339 for measuring odor since the test result is nonquantitative.

NOTE 6—For a more complete treatment of odor testing by sensory perception, see Method D1391.

## 14. Keywords

14.1 odor

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