Designation: D 1353 – 96 (Reapproved 2000)ε1

Standard Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products[1]

This standard is issued under the fixed designation D 1353; 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.

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

ε1 NOTE—Editorial changes were made throughout in May 2000.

1. Scope

1.1 This test method covers the determination of the nonvolatile matter in volatile solvents for use in paint, varnish, lacquer, and related products.

1.2 *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.* For specific hazard statements, see Section 5.

1.3 For hazard information and guidance, see the supplier's Material Safety Data Sheet for materials listed in this test method.

2. Referenced Documents

2.1 *ASTM Standards:*

E 180 Practice for Determining the Precision Data of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals[2]

E 299 Test Method for Trace Amounts of Peroxide in Organic Solvents[2]

3. Significance and Use

3.1 This test method describes the analytical measurement of residual matter in solvents that are intended to be 100 % volatile at 105 ± 5°C. Volatile solvents are used in the manufacture of paint, varnish, lacquer, and other related products, and the presence of any residue may affect the product quality or efficiency of the process. This test method is useful in manufacturing control and assessing compliance with specifications.

4. Apparatus

4.1 *Oven*, thermostatically controlled at 105 ± 5°C.

4.2 *Dish*, evaporating, platinum, 125-mL. A platinum evaporating dish is preferred. Alternatively, an aluminum or porcelain dish may be used (see Note 1).

NOTE 1—Precision data were determined utilizing only platinum dishes.

4.3 *Cylinder*, graduated, 100-mL.

4.4 *Analytical Balance*, precision to ±0.1 mg.

5. Hazards

5.1 **Warning**—Certain solvents and chemical intermediates, particularly, but not only ethers and unsaturated compounds, may form peroxides during storage. These peroxides may present a violent explosion hazard when the chemicals are evaporated. When peroxide formation is likely because of chemical type or length of storage time, analyze the material for peroxides (see Test Method E 299). If they exist in hazardous concentrations, take appropriate precautions such as destroying the peroxides before evaporation, shielding, or disposal of the sample and not running the test.

6. Procedure

6.1 Dry a 125-mL platinum evaporating dish in an oven at 105 ± 5°C and cool in a desiccator. Repeat until the weight is within 0.1 mg of the previous weighing.

6.2 With the graduated cylinder, measure 100 mL of sample at room temperature into the conditioned platinum evaporating dish, place on a steam bath and evaporate the specimen to dryness. Dry the outside of the dish with a clean, lint-free cloth and heat in an oven at 105 ± 5°C for approximately 1 h. Cool in a desiccator and weigh the evaporating dish and contents to 0.1 mg.

6.3 Return the dish and contents to the oven for 15 to 30 min, cool, and reweigh. Repeat, if necessary, until the weight is constant to within 0.1 mg of the previous weighing.

7. Report

7.1 Report as nonvolatile matter the residue obtained from

[1] This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D 01.35 on Solvents, Plasticizers, and Chemical Intermediates.

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[2] *Annual Book of ASTM Standards*, Vol 15.05.

the specimen as milligrams of nonvolatile residue/100 mL.

8. Precision and Bias [3]

8.1 *Precision*—The precision statements are based upon an interlaboratory study in which one operator in each of eight different laboratories analyzed one sample of methyl ethyl ketone in duplicate on two different days. This sample was prepared by adding 0.006 % of a nonvolatile resin to commercial methyl ethyl ketone. Platinum evaporating dishes were used in this study. The results were analyzed in accordance with Practice E 180. The within-laboratory standard deviation was found to be 0.26 mg/100 mL, and the between-laboratories standard deviation 0.71 mg/100 mL. Based upon these standard deviations, the following criteria should be used for judging the acceptability of results at the 95 % confidence level:

8.1.1 *Repeatability*—Two results, each the mean of duplicates, obtained by the same operator on different days should be considered suspect if they differ by more than 0.9 mg/100 mL.

8.1.2 *Reproducibility*—Two results, each the mean of duplicates, obtained by operators in different laboratories should be considered suspect if they differ by more than 2.4 mg/100 mL.

8.2 *Bias*—Bias can not be determined because there is no available material having an accepted reference value.

9. Keywords

9.1 nonvolatile matter; solvents; volatile solvents

[3] Supporting data are available from ASTM Headquarters. Request RR: D01 – 1044.