Designation: D 1353 – 02~~2~~3

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.

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 The following applies to all specified limits in this standard; for purposes of determining conformance with this standard, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E 29.

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.* For specific hazard statements, see Section 5.

1.~~4~~5 For hazard information and guidance, see the supplier's Material Safety Data Sheet for materials listed in this test method.

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[1] This test method is under the jurisdiction of ASTM Committee D01 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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***A Summary of Changes section appears at the end of this standard.**

2. Referenced Documents

2.1 *ASTM Standards:* [2]

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

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

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

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~~,~~ (see 4.2); place on a steam bath ~~and evaporate the specimen to dryness. Dry the outside of the dish with~~ or a ~~clean, lint-free cloth and heat~~ hot plate in ~~an oven at 105 ± 5°C for approximately 1 h. Cool in~~ a ~~desiccator~~ fume hood and ~~weigh the evaporating dish and contents to 0.1 mg.~~ evaporate. **Warning**—Since aliphatic hydrocarbons have low autoignition temperatures, only efficient hoods should be used.

NOTE 2—Precision data were obtained only with evaporation using steam bath.

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 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.

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[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*~~,~~ ~~Vol 15.05.~~ volume information, refer to the standard's Document Summary page on the ASTM website.

~~*Annual Book of*~~

[3] Supporting data are available from ASTM ~~Standards, Vol 14.02.~~ International Headquarters. Request RR:D01–1044.

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

SUMMARY OF CHANGES

Committee D01.35 has identified the location of selected changes to this standard since the last issue ~~(D 1353 - 96 (2000))~~ (D 1353 - 02̲) that may impact the use of this standard.

~~(1) Added Practice E 29 on significant digits~~
(1) Modified 6.2 to ~~the Scope.~~
~~(2) Added Practice E 29~~ highlight alternate evaporating dishes allowed in 4.2, as well as to allow the ~~Referenced Documents section.~~ use of a hot plate in a fume hood in evaporating the solvent.
(2) Added a new Note 2.