



Designation: **D1203—22** **D1203 – 23**

Standard Test Methods for Volatile Loss from Plastics Using Activated Carbon Methods¹

This standard is issued under the fixed designation D1203; 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 U.S. Department of Defense.

1. Scope*

1.1 These test methods cover the determination of volatile loss from a plastic material under defined conditions of time and temperature, using activated carbon as the immersion medium.

1.2 Two test methods are covered as follows:

1.2.1 *Test Method A, Direct Contact with Activated Carbon*—In this test method the plastic material is in direct contact with the carbon. This test method is particularly useful in the rapid comparison of a large number of plastic specimens.

1.2.2 *Test Method B, Wire Cage*—This test method prescribes the use of a wire cage, which prevents direct contact between the plastic material and the carbon. By eliminating the direct contact, the migration of the volatile components to the surrounding carbon is minimized and loss by volatilization is more specifically measured.

1.3 The values stated in SI units are to be regarded as the standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—This standard and ISO 176 address the same subject matter, but differ in technical content.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D618 Practice for Conditioning Plastics for Testing

D883 Terminology Relating to Plastics

¹ These test methods are under the jurisdiction of ASTM Committee D20 on Plastics and are the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials (Section D20.15.07 on Vinyls).

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

*A Summary of Changes section appears at the end of this standard

[D1600 Terminology for Abbreviated Terms Relating to Plastics](#)

[E456 Terminology Relating to Quality and Statistics](#)

~~[E617 Specification for Laboratory Weights and Precision Mass Standards](#)~~

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

[E2935 Practice for Evaluating Equivalence of Two Testing Processes](#)

2.2 *Other Documents:*

[ISO 176 Determination of the Loss of Plasticizers from Plastics by the Activated Carbon Method](#)³

3. Terminology

3.1 *Definitions*—For definitions of terms in this test method relating to plastics, refer to Terminology [D883](#). For abbreviations used in this test method, refer to Terminology [D1600](#), unless otherwise indicated.

3.2 For definitions of terms that appear in this test method relating to quality and statistics, refer to Terminology [E456](#).

4. Significance and Use

4.1 The test methods are intended to be rapid empirical tests which have been found to be useful in the relative comparison of materials having the same nominal thickness.

NOTE 2—When the plastic material contains plasticizer, loss from the plastic is assumed to be primarily plasticizer. The effect of moisture is considered to be negligible.

4.2 Correlation with ultimate application for various plastic materials shall be determined by the user.

5. Apparatus

5.1 *Balance*—~~An accurate analytical balance, equipped with ASTM Class 1 weights or better in accordance with Specification~~
Analytical balance with a resolution of 0.0001 g.~~[E617](#).~~

5.2 *Oven or Bath*—A thermostatically controlled oven or bath capable of maintaining the temperature to within $\pm 1^\circ\text{C}$ of the test temperature, which normally will be in the range from 50 to 150°C.

5.3 *Containers*—Metal cans or wide-mouth screw-top jars, of cylindrical form, approximately 100 mm in diameter and approximately 1/2 L in capacity.

NOTE 3—Pint paint cans work well.

5.4 *Micrometer*—A micrometer capable of measuring to the nearest 0.0025 mm for measuring the thickness of the test specimens.

5.5 *Metal Cages (for Test Method B)*—Wire cages constructed from approximately 30-mesh bronze gauze, in cylindrical form, having a diameter of 60 mm and a height of 6 mm, formed by soldering a strip of gauze at right angles to the periphery of a disk of bronze gauze. One of the bases acts as a lid.

5.6 *150 mL Beaker* graduated in 10 mL intervals.

6. Material

6.1 *Activated Carbon*—It has been found that different types and grades of activated carbon give differing results, thus making it necessary for the purchaser and the seller to agree on the same type and grade in order to obtain concordant results. Care shall be taken that an airtight storage container is used for the activated carbon and that fresh material is used for each test. The activated carbon shall be screened through a 14-mesh screen immediately prior to use to eliminate fines.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.