



Designation: D 3037 – 93

Standard Test Methods for Carbon Black—Surface Area By Nitrogen Adsorption¹

This standard is issued under the fixed designation D 3037; 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 These test methods cover the determination of the surface area of carbon blacks. The test methods appear in the following order:

	Sections
Test Method A—Surface Area by Ni-Count-1 Apparatus	9-14
Test Method B—Surface Area by Model 2200 Automatic Surface Area Analyzer	15-20
Test Method C—Surface Area by Continuous Flow Chromatography	21-27
Test Method D—Surface Area by Monosorb Surface Area Analyzer	28-35

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

1.3 Goal values for the standard reference blacks were determined by using Test Methods D 4820.

1.4 *This standard does not purport to address all of the safety problems, 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 precautionary statement, see Note 3.

2. Referenced Documents

2.1 ASTM Standards:

D 1799 Practice for Carbon Black—Sampling Packaged Shipments²

D 1900 Practice for Carbon Black—Sampling Bulk Shipments²

D 3324 Practice for Carbon Black—Improving Test Reproducibility Using ASTM Reference Blacks²

¹ These test methods are under the jurisdiction of ASTM Committee D-24 on Carbon Black and are the direct responsibility of Subcommittee D24.21 on Adsorptive Properties of Carbon Black.

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² *Annual Book of ASTM Standards*, Vol 09.01.

D 4483 Practice for Determining Precision for Test Method Standards in the Rubber and Carbon Black Industries²

D 4820 Test Methods for Carbon Black—Surface Area by Multipoint B.E.T. Nitrogen Adsorption²

3. Significance and Use

3.1 These test methods are used to measure the surface area of carbon black that is available to the nitrogen molecule.

4. Reagents

4.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.³ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

4.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean distilled water or water of equal purity.

5. ASTM D-24 Standard Reference Blacks

5.1 The apparatus shall be checked initially for correct calibration by testing the ASTM D-24 Standard Reference Blacks. These blacks shall be tested regularly, along with sample blacks, as described in Test Methods A through D. The standard value and range for each of the standard blacks, when tested by these test methods, is given in Practice D 3324.

5.1.1 In Test Methods A through D, all samples and standard blacks shall be dried for 1 h at 125°C before weighing. Cool and keep blacks in a well-maintained desiccator before taking

³ “Reagent Chemicals, American Chemical Society Specifications,” Am. Chemical Soc., Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see “Reagent Chemicals and Standards,” by Joseph Rosin, D. Van Nostrand Co., Inc., New York, NY, and the “United States Pharmacopeia.”