



## Designation: ~~D1514–04 (Reapproved 2011)~~ D1514 – 15

# Standard Test Method for Carbon Black—Sieve Residue<sup>1</sup>

This standard is issued under the fixed designation D1514; 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.

## 1. Scope

1.1 This test method covers the determination of the water wash sieve residue in regular untreated carbon blacks. It may not be applicable to oil-treated carbon blacks because the oil would prevent proper wetting of the black by water.

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

1.3 *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 precautionary statements, see Section 6.

## 2. Referenced Documents

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

[D1799 Practice for Carbon Black—Sampling Packaged Shipments](#)

[D1900 Practice for Carbon Black—Sampling Bulk Shipments](#)

[D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries](#)

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

## 3. Summary of Test Method

3.1 A sample of carbon black is washed with water through a wire-mesh screen of a specified size until all that remains is a non-carbon black residue. This residue is dried, weighed, and the amount of residue is expressed as mg/kg (ppm) of the original sample.

## 4. Significance and Use

4.1 The quantity of sieve residue of carbon black is important in some molded or extruded products as it may relate to the surface appearance of those products. The maximum residue in each application is normally determined and agreed to between the user and the producer.

## 5. Apparatus

5.1 *Sieve and Filtering Apparatus*,<sup>3,4</sup> as shown in [Fig. 1](#).

5.2 *Balance*, with a sensitivity of 0.01 g.

5.3 *Analytical Balance*, with a sensitivity of 0.1 mg.

5.4 *Oven*, gravity-convection type, capable of temperature regulation within  $\pm 1^\circ\text{C}$  at  $125^\circ\text{C}$  and temperature uniformity within  $\pm 5^\circ\text{C}$ .

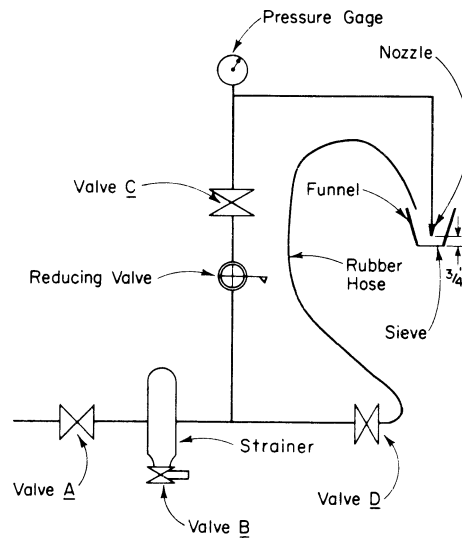
<sup>1</sup> This test method is under the jurisdiction of ASTM Committee [D24](#) on Carbon Black and is the direct responsibility of Subcommittee [D24.31](#) on Non-Carbon Black Components of Carbon Black.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto: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> Sieve and filtering apparatus, available from Titan Specialties, Inc., P.O. Box 2316, Pampa, TX 79066-2316, has been found suitable. The A2000 Test Set from Krahn IQS, GmbH, Paffrather Str. 13–15, D-51069 Koeln, Germany, has been found suitable. An ASTM specified apparatus modified with an enlarged funnel leg ID (5.080 cm or 2.0 in.) and sieve screen OD (6.032 cm or 2.375 in.) has also been found suitable.

<sup>4</sup> The sole source of supply of housing No. 20 and cartridge No. 30 known to the committee at this time is Amtek, Plymouth Products Division, 562 Indiana Ave., Sheboygan, WI 53081. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,<sup>1</sup> which you may attend.



NOTE 1—Industrial/O.E.M. filter and pleated polyester fabric reusable cartridges have been found to be a satisfactory strainer.<sup>4</sup>

NOTE 2—Corrosion-free piping must be used.

NOTE 3—Detailed drawings can be obtained from Test Method D1514 – 88a.

NOTE 4—Spray nozzle: Part No. 460.746.30 BE available from Lechler Inc., 445 Kautz Rd., St. Charles, IL 60174, or Titan Specialties Inc., P.O. Box 2316, Pampa, TX 70066-2316.

FIG. 1 Schematic Diagram of Apparatus for Sieve Residue Determination

5.5 Sieves, of either phosphor bronze or stainless steel. The sieve shall be in accordance with Specification E11. The sieve to be used shall be agreed upon between the purchaser and the seller.

5.6 Weighing Dishes.

## 6. Precautions

6.1 Keep the apparatus clean at all times to prevent contamination.

6.2 Examine the sieves each time they are used to make sure that no cracks or holes have developed.

6.3 Examine the strainer periodically to ascertain that the filter screen is in good condition.

## 7. Sampling

7.1 Samples shall be taken in accordance with Practice D1799 or Practice D1900.

## 8. Calibration

8.1 Calculate the sieve residue to the nearest mg/kg (ppm) as follows:

$$R = (W/S) \times 10^6 \quad (1)$$

where:

$R$  = sieve residue, mg/kg (ppm),  
 $W$  = mass of sieve residue, g, and  
 $S$  = mass of sample, g.

## 9. Procedure

9.1 Prior to making a test, clean the strainer by opening valves A and B and closing valve C as shown in Fig. 1. Allow the strainer to wash for 2 min.

9.2 Close valve B and open valve C. With valves A and C completely open, regulate the water pressure by means of a reducing valve. The recommended water pressure is  $207 \pm 34$  kPa ( $30 \pm 5$  lbf/in.<sup>2</sup>).

9.3 After the water pressure has been regulated, attach the sieve holder with a 50-mm (2-in.) diameter sieve to the funnel and allow the water to run through it for 3 min. Stop the water flow by closing valves A and C. Examine the sieve for particles; if none are observed, the apparatus is ready for use.

9.4 Weigh 100.0 g of the carbon black on the balance.

9.5 Attach the proper sieve to the funnel and start the water flow by opening valves A and C.