



Designation: D 3265 – 00

## Standard Test Method for Carbon Black—Tint Strength<sup>1</sup>

This standard is issued under the fixed designation D 3265; 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.

### 1. Scope

1.1 This test method covers the determination of the tint strength of carbon black relative to an industry tint reference black (ITRB).

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 *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.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 1799 Practice for Carbon Black—Sampling Packaged Shipments<sup>2</sup>

D 1900 Practice for Carbon Black—Sampling Bulk Shipments<sup>2</sup>

D 3324 Practice for Carbon Black—Improving Test Reproducibility Using ASTM Reference Blacks<sup>2</sup>

D 4483 Practice for Determining Precision for Test Method Standards in the Rubber and Carbon Black Industries<sup>2</sup>

### 3. Summary of Test Method

3.1 A carbon black sample is mixed with a white powder (zinc oxide) and a liquid vehicle (soybean oil epoxide) to produce a black or gray paste. This paste is then spread to produce a surface suitable for measuring the reflectance of the mixture by means of a photo-electric reflectance meter. The reflectance of the tested sample is then compared to the reflectance of the ITRB prepared in the same manner. The tint strength of the tested sample is expressed as units of the reflectance of the ITRB divided by the reflectance of the sample and multiplied by 100.

### 4. Significance and Use

4.1 For the broad range of commercial rubber grade carbon blacks, tint strength is highly dependent upon particle size. Tint

strength can be used as an indication of particle size; however, tint strength is also dependent on structure and aggregate size distribution. Therefore, differences in tint strength within grades of carbon black may reflect differences other than particle size.

NOTE 1—This test method was developed primarily for the characterization of N100, N200, and N300 series carbon blacks.

### 5. Apparatus

5.1 *Analytical Balance*, with a sensitivity of  $\pm 0.1$  mg.

5.2 *Automatic Muller*.<sup>3</sup>

5.3 *Photometric Instrument*, capable of detecting differences in the amount of light reflectance between shades of gray.<sup>4</sup> The instrument is to be operated following the manufacturer's instructions for optimum performance.

5.4 *Oven, Gravity-Convection Type*, capable of temperature regulation within  $\pm 1^\circ\text{C}$  at  $125^\circ\text{C}$  ( $\pm 2^\circ\text{F}$  at  $257^\circ\text{F}$ ) and temperature uniformity within  $\pm 5^\circ\text{C}$  ( $\pm 9^\circ\text{F}$ ).

5.5 *Reflectance Standards*, as required for each reflectance instrument for checking calibration.

5.6 *Spatulas*, 100 to 150 mm (4 to 6 in.), two, flexible, tapered.

5.7 *Syringe*, 5-cm<sup>3</sup>, automatic refilling, reproducible to  $\pm 0.02$  cm<sup>3</sup>.

5.8 *Wiping Tissue*, absorbent and lint free.

5.9 *Paste Application Apparatus*—Any one of the following groups of equipment may be used:

5.9.1 *Apparatus for Film Drawdown Method*:

5.9.1.1 *Film Applicator*,<sup>5</sup> 0.076 mm (0.003 in.) in depth.

5.9.1.2 *Polished Glass Plate*, approximately 760 by 500 by 10 mm (30 by 20 by 0.375 in.).

5.9.2 *Apparatus for Roller Spreader Method*:

<sup>3</sup> Hoover Automatic Muller, Model M5, available from Hoover Color Corp., P.O. Box 218, State Highway 693, Hiwassee, VA 24347, has been found satisfactory for this test method.

<sup>4</sup> The following instruments have been found satisfactory for this test method: Erichsen Tint Tester 527, available from T. G. Bell, Inc., 1340 Home Ave., Akron, OH 44310; Densichron Reflectometer, Catalog No. 3837, composed of the following parts: Model 1 Photometer-Linear Scale, Catalog No. 3830D; Reflection Head, Catalog No. 3832A; Regulated 6-V Transformer, Catalog No. 3834M; Reflection Tile Set (Standard), Catalog No. 3827T, available from Sargent-Welch Scientific Co., Densichron Div., 7300 N. Lander Ave., Skokie, IL 60076. This model is no longer available and the suggested replacement model 3867 B has not been found to be satisfactory. Hunter MiniScan XE or XE Plus, available from Hunter Associates Laboratory, Inc., 11491 Sunset Hills Road, Reston, Virginia 22090-5280.

<sup>5</sup> Film Applicator, Catalog No. AR-3800F, available from Pacific Scientific Co., 2431 Linden Ln., Silver Spring, MD 20910.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D24 on Carbon Black and is the direct responsibility of Subcommittee D24.11 on Absorptive Properties of Carbon Black.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 09.01.