



Designation: D3265 – 24a

Standard Test Method for Carbon Black—Tint Strength¹

This standard is issued under the fixed designation D3265; 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

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

D4821 Guide for Carbon Black—Validation of Test Method Precision and Bias

3. Summary of Test Method

3.1 A carbon black sample is mixed with a white powder (zinc oxide) and a liquid vehicle (epoxidized soybean oil, ESO)

¹ This test method is under the jurisdiction of ASTM Committee D24 on Carbon Black and is the direct responsibility of Subcommittee D24.21 on Carbon Black Surface Area and Related Properties.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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. The test value is therefore expressed in %.

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.

4.2 Tint strength values within the carbon black industry have been developed using an Automatic Muller apparatus which is used to prepare carbon black-zinc oxide pastes. An alternative mixing apparatus, Hauschild SpeedMixer^{3,4} (DAC 150 FVZ), and a corresponding procedure have been extensively studied within D24 and shown to provide equivalent tint strength for all carcass or soft blacks. However, tint values for tread and high surface area specialty carbon blacks are typically lower when the SpeedMixer is used to prepare the paste. Therefore, the SpeedMixer should not be used for tread and high surface area specialty carbon blacks, and it is the responsibility of the user of this alternate apparatus to ensure their products will adequately disperse. Disputes arising between a user and producer should be resolved using the Automatic Muller apparatus until ASTM develops adequate precision statements.

³ The sole source of supply of the apparatus – Hauschild SpeedMixer®, which has been qualified for this method, including the DAC150 FVZ – known to the committee at this time is Hauschild, www.hauschild-speedmixer.com.

⁴ 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,¹ which you may attend.