



Designation: D4527 – 18 (Reapproved 2023)

Standard Test Method for Carbon Black—Solvent Extractables¹

This standard is issued under the fixed designation D4527; 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 procedure for measuring carbon black solvent extractables.

1.1.1 This test method determines the total material extracted from carbon black by toluene under specified conditions. The procedure is also applicable to other solvents such as cyclohexane, etc.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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.* For a specific precautionary statement, see Section 7.

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

D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries

¹ 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.

Current edition approved Jan. 1, 2023. Published February 2023. Originally approved in 1985. Last previous edition approved in 2018 as D4527 – 18. DOI: 10.1520/D4527-18R23.

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.

3. Summary of Test Method

3.1 A specimen of carbon black is extracted for 48 h (or other specified time) in a Soxhlet extractor, the solvent removed by controlled temperature evaporation, and the extracted residue determined gravimetrically. If the carbon black extractables are to be subjected to additional analysis, see Section 7.

4. Significance and Use

4.1 The carbon black extract test procedure provides a uniform and precise method for the gravimetric determination of organic-solvent extractables on carbon black. Accuracy and precision are acceptable for most specification or regulatory purposes, or both. However, carbon black with very low extract (less than 0.02 %) may require a more rigorous extraction procedure. The actual chemical composition of the extract can vary significantly with the type and origin of the carbon black.

5. Apparatus

5.1 *Soxhlet Extraction Apparatus*, with interchangeable ground joints, 40 mm I.D. extraction tube, and 250-cm³ flask.³

5.2 *Extraction Thimble*, glass, 35-mm diameter by 90-mm height, with coarse porosity fritted disc.⁴ When filled with 50 cm³ of toluene, drainage time for the first 40 cm³ should not exceed 95 s. Discard thimbles taking longer.

5.3 *Heater*, for extraction flask, with adjustable heat input. A hot plate extraction heater or hemispherical heating mantle is preferred.

5.4 *Filter Funnel*, glass fritted disc type, with medium porosity fritted disc.

5.5 *Filter Flask*, 125 or 250 cm³.

³ Fisher Scientific No. 9-556B available from Fisher Scientific Co., 203 Fisher Ave., Pittsburgh, PA 15219, has been found satisfactory. The use of Kontas K-586100 (glass jacketed) available from Kontas Glass Co., 8000 Spruce St., Vineland, NJ 08360, simplifies insulating the apparatus and reduces the possibility of breakage.

⁴ Fisher Scientific 9-653B available from Fisher Scientific Co., has been found satisfactory.