



Standard Test Method for Carbon Black—Solvent Extractables¹

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

2. Referenced Documents

2.1 ASTM Standards:

D 3051 Practice for Carbon Black—Stating the Precision of ASTM Test Methods²

D 3396 Practice for Carbon Black—Measuring the Precision of ASTM Test Methods²

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.

5.6 *Water Bath*, or other suitable warming means for evaporating solvent from extract at a controlled temperature of 40 to 50°C.

5.7 *Container*, suitable for final solvent removal and weighing of residue. A light weight aluminum dish 63 by 17.5 mm, a TFE-fluorocarbon cup or a 50-cm³ glass beaker is suggested.⁵

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

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

5.10 *Desiccator*.

5.11 *Analytical Balance*, with a sensitivity of ± 0.1 mg.

¹ This test method is under the jurisdiction of ASTM Committee D-24 on Carbon Black and is the direct responsibility of Subcommittee D24.31 on Non-Carbon Black Components of Carbon Black.

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

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.

⁵ Fisher Scientific No. 8-732-5C (aluminum dish) available from Fisher Scientific Co., and Ventron No. 2034 (teflon cup) available from Ventron Instrument Corp., Cahn Division, 16707 S. Carmenita Rd., Cerritos, CA 90701, have been found to be satisfactory.