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.

Designation: D5805 – 00 (Reapproved 2019)

Standard Test Methods for Rubber—Determination of Carbon Black in Masterbatches[1]

This standard is issued under the fixed designation D5805; 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 These test methods cover the determination of the amount of carbon black in a masterbatch and cover emulsion SBR-carbon black mixtures, but may be applicable to other polymers. Three test methods are included:

	Sections
Inert Atmosphere Pyrolysis	3 – 10
Vacuum Pyrolysis	11 – 17
Thermogravimetric Analyzer	18 – 24

NOTE 1—The nomenclature used in these test methods is in accordance with Practice D1418.

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]

D1418 Practice for Rubber and Rubber Latices—Nomenclature

D6370 Test Method for Rubber—Compositional Analysis by Thermogravimetry (TGA)

TEST METHOD A—CARBON BLACK

Inert Atmosphere Pyrolysis Test Method

3. Summary of Test Method

3.1 The prepared dried sample and a sample of standard SBR black determinate are tested in triplicate. The samples are weighed accurately into tared crucibles and then placed in a combustion tube at 550°C, which is continuously flushed with CO_2 until the rubber hydrocarbon is distilled. The crucibles and contents are cooled in a desiccator, weighed, then inserted into a muffle furnace at 550°C until all carbonaceous material is burned. The crucible and contents are again cooled in a desiccator and weighed. The percentage of carbon black is calculated from the weights.

4. Significance and Use

4.1 The carbon black content of an unvulcanized black or oil-black SBR masterbatch may be determined by this test method if an inert (CO_2) atmosphere and a determinate (see Note 2) of known carbon black content are available.

NOTE 2—Determinate black masterbatch may be prepared by careful addition of exact amounts of rubber and carbon black on a mill. An alternative would be a thorough blending of a quantity of black masterbatch and determination of the carbon black by use of a previously established determinate.

5. Apparatus

5.1 *Drying Oven.*

5.2 *Porcelain Crucibles,* No. 00000, tared.

5.3 *Weighing Bottles,* tared.

5.4 *Fused Alumina Combustion Boats.* [3]

5.5 *Combustion Tubes.* [4]

5.6 *Combustion Furnace.*

[1] These test methods are under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and are the direct responsibility of Subcommittee D11.11 on Chemical Analysis.

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[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] Alundum No. 3 combustion boats have been found satisfactory for this purpose.

[4] The sole source of supply of the combustion tube known to the committee at this time is the McDaniel high-temperature combustion tube, 30 in. (762 mm) long by 1 in. (25.4 mm) in diameter available from Dunlap and Co., 623 Staring Lane, Baton Rouge, LA 70810. This tube will accommodate a maximum of two combustion boats containing six samples each within the heated area of the furnace. 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.

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