



Designation: D 6602 – 02

## Standard Practice for Sampling and Testing of Possible Carbon Black Fugitive Emissions or Other Environmental Particulate, or Both<sup>1</sup>

This standard is issued under the fixed designation D 6602; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This practice covers sampling and testing for distinguishing carbon black from other environmental particulates.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information.

1.3 *This standard may involve hazardous materials, operations, and equipment. 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.*

1.4 This practice requires some degree of expertise on the part of the microscopist. For this reason, the microscopist must have adequate training and substantial on-the-job experience in identifying the morphological parameters of carbon black.

### 2. Referenced Documents

2.1 *ASTM Standards:*

D 1619 Test Methods for Carbon Black—Sulfur Content<sup>2</sup>

D 3053 Terminology Relating to Carbon Black<sup>2</sup>

D 3849 Test Method for Carbon Black—Primary Aggregate Dimensions from Electron Microscope Image Analysis<sup>2</sup>

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *aciniform*—shaped like a cluster of grapes.

3.1.2 *Aciniform Carbon*—colloidal carbon having a morphology consisting of spheroidal primary carbon particles fused together in aggregates of colloidal dimension in a shape like grape clusters, where the primary particles are comprised of turbostratic layers.

3.1.3 *carbon black*—a submicron black carbon powder commercially produced under controlled conditions by burning hydrocarbons in insufficient air; it is composed of colloidal carbon of well-defined acinoform morphology (see Annex A1) with a minimum of tars and other extraneous materials.

3.1.4 *chain of custody*—a document describing the condi-

tion of a sample during its collection, analysis, and disposal.

3.1.5 *char*—a particulate larger than 1  $\mu\text{m}$  made by incomplete combustion which may not deagglomerate or disperse by ordinary techniques, may contain material which is not black, and may contain some of the original material's cell structure, minerals, ash, cinders, and so forth.

3.1.6 *fugitive dust*—transitory, fleeting material comprised of particulates foreign to the surface of deposition.

3.1.7 *fungus, sooty mold, mildew*—particulates from a superficial growth that grows on living and decaying organic matter.

3.1.8 *mineral and urban dust*—airborne, naturally occurring inorganic particulates inherent to the area.

3.1.9 *pollen*—particulates from a mass of microspores in a seed plant.

3.1.10 *rubber dust*—finely divided soft particulates abraded from rubber.

3.1.11 *sample*—a small fractional part of a material or a specified number of objects that are selected for testing, inspection, or specific observations of particular characteristics.

3.1.12 *soot*—a submicron black powder generally produced as an unwanted by-product of combustion or pyrolysis. It consists of various quantities of carbonaceous and inorganic solids in conjunction with adsorbed and occluded organic tars and resins.

3.1.12.1 *Discussion*—The carbonaceous portion also is colloidal and often has the acinoform morphology. Soot may have several carbon morphologies. Examples of soot are carbon residues from diesel and gasoline engines, industrial flares, sludge pits, burning tires, and so forth.

3.1.13 *sticky tape*—a section of tape with a sticky, solvent-soluble adhesive used in the collection of particles from surfaces.

3.1.14 *surface*—the outer surface, facing, or exterior boundary of an object capable of supporting carbon and other fugitive and natural occurring dusts and particulates.

3.1.15 *turbostratic*—a type of graphitic crystallographic structure in which there is no symmetry along the z-axis.

3.2 *Acronyms:*

3.2.1 *EDS*—energy dispersive spectroscopy associated with SEM and TEM for the identification of elemental composition,

3.2.2 *LM*—light microscope,

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D24 on Carbon Black and is the direct responsibility of Subcommittee D24.81 on Carbon Black Microscopy and Morphology.

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