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Standard Terminology of Coal and Coke¹

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1. Scope

1.1 This terminology defines the technical terms used in standards that are the responsibility of Committee D05 on Coal and Coke. The terms are used in:

1.1.1 The sampling of coal and coke under conditions required for most commercial and technical purposes related to coal and coke.

1.1.2 Bias and related statistical testing,

1.1.3 The description of coal, both visually in the field and microscopically in the laboratory,

1.1.4 Chemical and physical analyses of coal and coke,

1.1.5 Classification of coal, and

1.1.6 Certain other related practices and guides applicable to the coal and coke industries.

1.2 *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

D388 Classification of Coals by Rank

D1412 Test Method for Equilibrium Moisture of Coal at 96 to 97 Percent Relative Humidity and 30 °C

D1857 Test Method for Fusibility of Coal and Coke Ash

D2013 Practice for Preparing Coal Samples for Analysis

D2234/D2234M Practice for Collection of a Gross Sample of Coal

D2639 Test Method for Plastic Properties of Coal by the Constant-Torque Gieseler Plastometer

D2798 Test Method for Microscopical Determination of the Vitrinite Reflectance of Coal

D3172 Practice for Proximate Analysis of Coal and Coke

D3173 Test Method for Moisture in the Analysis Sample of Coal and Coke

D3174 Test Method for Ash in the Analysis Sample of Coal and Coke from Coal

D3175 Test Method for Volatile Matter in the Analysis Sample of Coal and Coke

D3176 Practice for Ultimate Analysis of Coal and Coke

D3180 Practice for Calculating Coal and Coke Analyses from As-Determined to Different Bases

D3302 Test Method for Total Moisture in Coal

D4371 Test Method for Determining the Washability Characteristics of Coal

D4749 Test Method for Performing the Sieve Analysis of Coal and Designating Coal Size

D5061 Test Method for Microscopical Determination of the Textural Components of Metallurgical Coke

D5114 Test Method for Laboratory Froth Flotation of Coal in a Mechanical Cell

D5192 Practice for Collection of Coal Samples from Core

D5263 Test Method for Determining the Relative Degree of Oxidation in Bituminous Coal by Alkali Extraction

D5515 Test Method for Determination of the Swelling Properties of Bituminous Coal Using a Dilatometer

D5865 Test Method for Gross Calorific Value of Coal and Coke

D6316 Test Method for Determination of Total, Combustible and Carbonate Carbon in Solid Residues from Coal and Coke

D7430 Practice for Mechanical Sampling of Coal

D7582 Test Methods for Proximate Analysis of Coal and Coke by Macro Thermogravimetric Analysis

3. Terminology

air-dried moisture—this term has been used inappropriately to refer to both residual moisture and air-dry loss. Because of the potential for confusion, this term shall not be used.

air drying, n —a process of partial drying of coal to bring its moisture near to equilibrium with the atmosphere in the room in which further reduction and division of the sample will take place.

¹ This terminology is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.24 on Statistics.

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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.

air-dry loss, *n*— *in coal*, the loss in mass, expressed as a percentage, resulting from each air-drying stage or the sum of all sequential air-drying stages in which the results from each stage are adjusted to the as-received basis.

DISCUSSION—Air-dry loss is neither a standard state nor a characteristic property of a coal. Air drying only removes water that can evaporate at or near ambient laboratory conditions, leaving in the coal some fraction of the inherent moisture that is more tightly bound in the pores (residual moisture). Different laboratory environments or different drying temperatures or both will result in significant differences in air-dry loss and residual moisture. **D3302**

agglomerating, *adj*—*as applied to coal*, the property of softening when it is heated to above about 400 °C in a nonoxidizing atmosphere, and then appearing as a coherent mass after cooling to room temperature.

alginite—See *alginite* under **maceral**.

analysis sample—See *analysis sample* under **sample**.

angle of repose, *n*—the greatest angle, measured from horizontal, attained by a coal so that material on the sides or top of the inverted cone or trench created in car top sampling remains stable, that is, will not shift or slide. Coal size and moisture content are contributing factors to this angle. In all cases, the coal shall be dug so that the physical angle is less than the angle of repose.

anisotropic, *adj*—*as used in Test Method D5061*, exhibiting optical properties of different values when viewed with an optical microscope having mutually exclusive polarized light, for example, crossed nicols. **D5061**

anthracite—See *anthracite* under **rank**.

anthracitic class—See *anthracitic class* under **rank**.

apparent rank, *n*—*of coal*, the rank designation obtained on samples other than channel samples, but otherwise conforming to procedures of Classification **D388**.

as-analyzed moisture—synonym for *as-determined moisture*.

as-determined basis—See *as-determined basis* under **reporting bases**.

ash, *n*—inorganic residue remaining after ignition of combustible substances, determined by definite prescribed methods.

DISCUSSION—Ash need not be identical, in composition or quantity, with the inorganic substances present in the material before ignition. In the case of coal and coke, the methods used shall be those prescribed in Test Method **D3174** or **D7582**.

as-mined coal—*for the purpose of Test Method D4749*, same as **run-of-mine (ROM) coal**. **D4749**

as-received basis—See *as-received basis* under **reporting bases**. **D3180**

as-shipped or produced coal—*for the purpose of Test Method D4749*, raw or prepared coal in any state or condition at which it leaves the mine property or loading facility. **D4749**

attrital coal—See *attrital coal* under **coal**.

auger increment, *n*—the retained portion of one extraction operation of the auger.

banded coal—See *banded coal* under **coal**.

basis—See **reporting bases**.

bed moisture—synonym for *inherent moisture*.

beehive coke—See *beehive coke* under **coke**.

binder phase, *n*—*as used in Test Method D5061*, a continuous solid carbon matrix formed during the thermoplastic deformation of those coal macerals that become plastic during carbonization.

DISCUSSION—The binder phase material is formed from the thermoplastic deformation of reactive (vitrinite and liptinite) and semi-inert (semifusinite) coal macerals of metallurgical bituminous coals. During thermoplasticity, the inert coal maceral and mineral are partly or wholly incorporated into the binder phase. Also, most of the coke pores are located in the binder phase. **D5061**

bituminous class—See *bituminous class* under **rank**.

boghead coal—See *boghead coal* under **coal**.

bone coal—See *bone coal* under **coal**.

borehole, *n*—the circular hole through soil and rock strata made by boring.

bottomsize, nominal—*for the purpose of Test Method D4749*, the sieve designating the lower limit or bottomsize shall be that sieve of the series given in the Standard Series of Sieves section with the largest openings through which passes a total of less than 15 % of the sample. This defined bottomsize is not to be confused with the size of the smallest particles in the lot.

DISCUSSION—(Warning)—In the case of a commercial, double-screened product, for example, 37.5 by 9.5 mm (1½ by ¾ in.), this designation may *not* be valid. In such commercial or contractual situations, the amount of allowable material smaller than the bottomsize (for example, 9.5 mm) must be specified by the contract under which the coal is bought and sold. **D4749**

briquette, *n*—a cylindrical block composed of granulated coal or coke particles compressed and embedded with an epoxy binder.

by-product coke—See *by-product coke* under **coke**.

C test, *n*—a standard statistical test for homogeneity of variance.

calorific value, *n*—the heat of combustion of a unit quantity of a substance.

DISCUSSION—It is expressed in ASTM test methods in British thermal units per pound (Btu/lb). Calorific value can also be expressed in calories per gram (cal/g) or in the International System of Units, joules per gram (J/g), when required. **D5865**

calorimeter, *n*—*as used in Test Method D5865*, the bomb and its contents, the calorimeter vessel with stirrer, the water in which the bomb is immersed, and the portions of the thermometer and the ignition leads within the calorimeter vessel. **D5865**

calorimeter jacket, *n*—the insulating medium surrounding the calorimeter.

cannel coal—See *cannel coal* under **coal**.

carbonate carbon, *n*—the carbon content present in the solid products derived from the combustion or reaction of coal, coal by-products, or coke as carbonates and which is noncombustible in standard industry practice. **D6316**