



Designation: D5865/D5865M – 19

Standard Test Method for Gross Calorific Value of Coal and Coke¹

This standard is issued under the fixed designation D5865/D5865M; 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 pertains to the determination of the gross calorific value of coal and coke by either an isoperibol or adiabatic combustion calorimeter.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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.* Specific hazard statements are given in Section 8.

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

D121 Terminology of Coal and Coke

D346 Practice for Collection and Preparation of Coke Samples for Laboratory Analysis

D388 Classification of Coals by Rank

D1193 Specification for Reagent Water

D2013 Practice for Preparing Coal Samples for Analysis

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

D3177 Test Methods for Total Sulfur in the Analysis Sample of Coal and Coke (Withdrawn 2012)³

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

D4239 Test Method for Sulfur in the Analysis Sample of Coal and Coke Using High-Temperature Tube Furnace Combustion

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

E144 Practice for Safe Use of Oxygen Combustion Vessels

E178 Practice for Dealing With Outlying Observations

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

3. Terminology

3.1 For additional definitions of terms used in this test method, refer to Terminology D121.

3.2 *Definitions:*

3.2.1 *adiabatic calorimeter, n*—a calorimeter that operates in the adiabatic mode and may or may not use a microprocessor; the initial temperature before initiating the combustion and the final temperatures are recorded by the operator or the microprocessor.

3.2.2 *automated calorimeter, n*—a calorimeter which has a microprocessor that takes the thermometric readings and calculates the Calibration Value and the Heat of Combustion Values.

3.2.3 *British thermal unit [Btu], n*—the amount of heat required to raise the temperature of one pound - mass [lbm] of liquid water at one atmosphere pressure one degree Fahrenheit at a stated temperature.

3.2.3.1 *Discussion*—The results of combustion calorimetric tests of fuels for steam power plants may be expressed in terms of the 1956 International Steam Table calorie (I.T. cal) which is defined by the relation, 1 I.T. cal = 4.1868 J. The Btu used in

¹ This test method is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.21 on Methods of 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 The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard