



Standard Practice for Establishing the Competence of Laboratories Using ASTM Procedures in the Sampling and Analysis of Coal and Coke¹

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1. Scope

1.1 This practice specifies requirements to operate and evaluate the quality and management systems in a laboratory that provides services with respect to sample collection, sample preparation, or testing of coal, coke, and ash derived from coal or coke using ASTM standards that are under the jurisdiction of Committee D05 on Coal and Coke.

NOTE 1—The word “laboratory” is used throughout this practice when referring to an organization that provides services in coal sampling or testing, or both. It is recognized, however, that the word may not be appropriate to an organization that does not perform actual laboratory sample testing.

1.2 International standard ANSI/ISO/IEC 17025 shall be the governing document specifying requirements for management, technical competence and evaluation of a laboratory.

NOTE 2—An accrediting body or user of laboratory services can also impose technical or non-technical requirements not specifically addressed in ANSI/ISO/IEC 17025 provided they do not invalidate the requirements of ANSI/ISO/IEC 17025.

1.3 This practice is used to evaluate only those capabilities specifically claimed by a laboratory.

1.4 All percentages are percent mass fractions unless otherwise noted.

1.5 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

D121 Terminology of Coal and Coke

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

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

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

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

D6172 Test Method for Determining the Volume of Bulk Materials Using Contours or Cross Sections Created by Direct Operator Compilation Using Photogrammetric Procedures

E2554 Practice for Estimating and Monitoring the Uncertainty of Test Results of a Test Method Using Control Chart Techniques

2.2 ANSI/ISO/IEC Document:³

17025 General Requirements for the Competence of Calibration and Testing Laboratories

2.3 ISO Documents:⁴

5725-3 Accuracy (Trueness and Precision) of Measurement Methods and Results—Part 3: Intermediate Measures of Precision of a Standard Measurement Method

5725-6 Accuracy (Trueness and Precision) of Measurement Methods and Results—Part 6: Use in Practice of Accuracy Values

3. Significance and Use

3.1 International standard ANSI/ISO/IEC 17025 promotes the use of documented accountability and quality control procedures to assure a laboratory and its clients that the laboratory can produce technically valid data and results in the routine performance of its sampling, sample preparation and testing activities.

3.2 A laboratory shall use ANSI/ISO/IEC 17025 to develop its quality system. Clause 4 of ANSI/ISO/IEC 17025 specifies the requirements for sound management. Clause 5 of ANSI/

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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 Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

ISO/IEC 17025 specifies the requirements for technical competence for the type of tests or calibrations, or both the laboratory undertakes.

3.3 In addition to complying with the requirements of ANSI/ISO/IEC 17025, the Annex of this standard practice contains information that shall be considered important for the evaluation and operation of a competent Coal and Coke sampling or testing facility, or both. The information in this Annex is presented where it is not otherwise covered in ANSI/ISO/IEC 17025 or the applicable ASTM methods.

3.4 Laboratory clients, regulatory authorities, and accreditation bodies that recognize the competence of testing and calibration laboratories can use this standard practice as the basis for their evaluation.

3.5 The primary significance of this practice is to establish that for a laboratory to generate measurements traceable to SI units, it must:

3.5.1 Have a clear understanding of the work requested by the client.

3.5.2 Meet the quality system requirements of the internationally accepted ANSI/ISO/IEC 17025 standard.

3.5.3 Use test methods which have been shown to be traceable to SI units of measurement.

3.5.4 Be able to demonstrate that the laboratory is in statistical control at the time the measurements are made.

4. Selection of an Evaluator

4.1 The evaluator(s) shall have sufficient technical background to competently evaluate the application of ASTM standards employed for the sampling, preparation and analysis of coal, coke, and ash derived from coal or coke.

4.2 The evaluator(s) shall review the laboratory with the aid of a worksheet or checklist. Worksheets or checklists shall be developed from the requirements of Clause 4 and Clause 5 of ANSI/ISO/IEC 17025 in concert with specific technical requirements specified in the ASTM standard(s) to be evaluated.

4.3 Observations and comments made by the evaluator shall be keyed to item numbers in the checklist.

5. Keywords

5.1 accuracy; competence; evaluation; laboratory; management; stability

ANNEX

(Mandatory Information)

A1. FACTORS AFFECTING THE TECHNICAL VALIDITY OF TESTS

INTRODUCTION

Factors that can influence the technical validity of tests performed by a laboratory include but are not limited to:

- (1) Sampling apparatus operation,
- (2) Sampling procedures,
- (3) Sample preparation apparatus,
- (4) Sample preparation operation,
- (5) Sample preparation procedures,
- (6) Laboratory equipment,
- (7) Laboratory equipment operation,
- (8) Test methods,
- (9) Calibration, control and consumable materials,
- (10) Calibration,
- (11) Uncertainty of measurement,
- (12) Control charts,
- (13) Reporting procedures,
- (14) Qualification of laboratory personnel, and
- (15) Environmental conditions (sampling, sample preparation and analyses).

This annex while mandatory, identifies several items as a “typical practice”. A “typical practice” is not to be considered the only correct practice. Typical practices have been included throughout this Annex only for the purpose of clarifying the content of this Annex.

The extent to which the factors contribute to the technical validity of results can differ considerably between tests. The laboratory shall have procedures that address these factors where these are applicable and under the laboratory’s control.

ANSI/ISO/IEC 17025 Clause 4.1.5 states:

“The laboratory shall have managerial and technical personnel who, irrespective of other responsibilities, have the authority and resources needed to carry out their duties, including the