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: D6543 – 20ε1

Standard Guide to the Evaluation of Measurements Made by Online Coal Analyzers[1]

This standard is issued under the fixed designation D6543; 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.

ε1 NOTE—An editorial correction was made to 7.3.3.5 in November 2022.

1. Scope

1.1 This guide provides techniques to be used for the evaluation of the measurement performance of online coal analyzers.

1.2 *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.*

1.3 *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

D2013 Practice for Preparing Coal Samples for Analysis

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

D6518 Practice for Bias Testing a Mechanical Coal Sampling System (Withdrawn 2008)[3]

D7430 Practice for Mechanical Sampling of Coal

E178 Practice for Dealing With Outlying Observations

3. Terminology

3.1 *Definitions*—For additional definitions of terms used in this standard, refer to Terminology D121.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *analyzer system, n*—a coal quality measurement system which includes an online coal analyzer and which may include one or more stages of a coal-sampling system.

3.2.2 *calibration, n*—mathematical modeling of analyzer and comparative coal sampling and analysis data.

3.2.2.1 *Discussion*—Factors from the model are used in the online analyzer control software.

3.2.3 *full-stream analyzer, n*—an analyzer system that interrogates the coal on a process belt.

3.2.4 *Grubbs estimator, n*—an estimate of the measurement precision of an online analyzer (**1-3**).[4]

3.2.5 *Latent Variable Model, n*—a mathematical model that can estimate each system's precision, when the analyzer is compared to two independent reference systems.

3.2.6 *online analyzer, n*—an analytical tool consisting of an instrument and systems, which together provide measurements, or estimates, or both, of coal quality parameters.

3.2.7 *outlier, n*—an extreme value that statistical tests indicate to be far enough from other results in a population under consideration to cause suspicion that the value is not a member of the population.

3.2.8 *reference material, n*—material of stable composition that may be used to generate static analyzer measurements.

3.2.9 *reference system, n*—a measurement system used to measure the characteristics of a lot of coal that are also measured by an online analyzer, and against which the online analyzer measurements are compared.

3.2.10 *sample stream analyzer, n*—an analyzer system that is fed a save or reject stream from a sampling system.

3.2.11 *standardization, n*—calibration of an instrument to a reference material using static stability measurements.

3.2.12 *static stability, n*—an estimate of the measurement precision of an instrument obtained on material that is not moving.

[1] This guide is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.23 on Sampling.

Current edition approved Feb. 1, 2020. Published February 2020. Originally approved in 2000. Last previous edition approved in 2017 as D6543 – 17a. DOI: 10.1520/D6543-20E01.

[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.

[4] The boldface numbers in parentheses refer to the list of references at the end of this standard.

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