



Standard Test Method for Determination of Bulk Density of Coal Using Nuclear Backscatter Depth Density Methods¹

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INTRODUCTION

Data obtained from the density of coal stockpiles is combined with volume determinations per Test Method D 6172 to complete the physical inventory of total tons. The book inventory is compared to the physical inventory for determining the accumulation of measurement difference that have occurred since the last physical inventory.

Since the physical inventory is the reference value used to compare and adjust the book inventory, it is important that the standard methods for conducting the density and volume measurements introduce the least possible error. Close adherence to the details of the procedures described in this standard is a prerequisite to the objective of this test method.

This standard test method for determination of bulk density of stockpiled coal is used for all ranks of coal. Proper density determination involves an understanding of the physical characteristics of the coal types and the stockpiling facilities.

1. Scope

1.1 This test method covers procedures for determining the bulk density of coal using instrumentation that measures the relative backscatter of nuclear gamma radiation throughout the depth of the stockpile under test.

1.2 This procedure is applicable to all ranks of coal.

1.3 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 exact equivalents; therefore, each system must be used independent of the other. Within the text, SI units are shown in brackets.

1.4 *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. The equipment uses radioactive materials, which may be hazardous to the health of users, unless proper precautions are taken.*

2. Referenced Documents

2.1 ASTM Standards:

D 121 Terminology of Coal and Coke²

D 1586 Test Method for Penetration Test and Split-Barrel Sampling of Soils³

D 3180 Practice for Calculating Coal and Coke Analysis from As-Determined to Different Bases²

D 6172 Test Method Determining the Volume of Bulk Materials Using Contours of Cross Sections Created by Direct Operator Compilation Using Photogrammetric Procedures²

E 105 Practice for Probability Sampling of Materials⁴

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process⁴

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods⁴

E 456 Terminology Related to Quality and Statistics⁴

2.2 NIST Standard:

National Institute for Standards and Technology Handbook 44, Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices⁵

2.3 ASME Standard:

ASME Pipe Codes⁶

2.4 Code of Federal Regulations:

¹ This test method is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D 05.07 on Physical Characteristics of Coal.

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² *Annual Book of ASTM Standards*, Vol 05.06.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

⁵ Available from National Institute of Standards and Technology (NIST), Gaithersburg, MD 20899.

⁶ Available from American Society of Mechanical Engineers, 345 E. 47th St., New York, NY 10017.