



Standard Test Method for Microscopical Determination of the Maceral Composition of Coal¹

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1. Scope

1.1 This test method covers the equipment and techniques used for determining the physical composition of a coal sample in terms of volume percent of the organic components and of mineral matter, if desired.

1.2 The term *weight* is temporarily used in this test method because of established trade usage. The word is used to mean both force and mass and care must be taken to determine which is meant in each case (the SI unit for force is newton and for mass, kilogram).

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 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
- D2797 Practice for Preparing Coal Samples for Microscopical Analysis by Reflected Light
- D2798 Test Method for Microscopical Determination of the Vitrinite Reflectance of Coal
- 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
- E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
- E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

¹ This test method is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.28 on Petrographic Analysis of Coal and Coke.

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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. Terminology

3.1 *Definitions*—For definitions of terms, refer to Terminology D121.

3.2 *Classification*—The classification of the microscopic constituents into groups of similar properties in a given coal is as follows:

Maceral Group	Maceral
Vitrinite	—
Liptinite or (exinite)	alginite
	cutinite
	resinite
	sporinite
	fusinite
	inertodetrinite
Inertinite	macrinite
	micrinite
	funginite
	secretinite
	semifusinite

3.3 Many laboratories associated with the coke-making industry use the following simplified classification for petrographic analysis of bituminous coal:

- vitrinite
- liptinite (other than resinite)
- resinite
- semifusinite
- micrinite
- fusinite
- mineral matter

3.4 *Definitions of Terms Specific to This Standard:*

3.4.1 *alginite, n*—a liptinite maceral that is generally spherical or ovoid, frequently having a crenulated border and somewhat irregular reflectance and sometimes occurring in clusters reflecting an origin from *Botryococcus* algae.

3.4.1.1 *Discussion*—Alginite often occurs as degraded fragments derived from colonial or unicellular bodies.

3.4.2 *cutinite, n*—a liptinite maceral in the form of a sheet reflecting its origin from leaf- or twig-covering plant cuticle, frequently exhibiting reticulation in planar section and a serrated edge in cross section.

3.4.3 *exinite, n*—Deprecated term. Use preferred term **liptinite**; sometimes has also been used as a synonym for sporinite.