Designation: D 586 – 97 (Reapproved 2002)

An American National Standard

Standard Test Method for Ash in Pulp, Paper, and Paper Products[1]

This standard is issued under the fixed designation D 586; 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 describes the determination of the ash content of pulp, paper, and paper products by ignition at two different temperatures:

1.1.1 *Method A*—Ash content upon ignition at 525°C.

1.1.2 *Method B*—Ash content upon ignition at 900°C.

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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 585 Practice of Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, or Related Product[2]

D 644 Test Method for Moisture Content of Paper and Paperboard by Oven Drying[2]

D 686 Test Methods of Qualitative Examination of Mineral Filler and Mineral Coating of Paper[2]

D 1968 Terminology Relating to Paper and Paper Products[2]

3. Terminology

3.1 *Definitions:*

3.1.1 Definitions shall be in accordance with Terminology D 1968 and the *Dictionary of Paper*.[3]

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *ash at 525°C*—the ash content of the sample when the ignition temperature is 525°C.

3.2.2 *ash at 900°C*—the ash content of the sample when the ignition temperature is 900°C.

4. Summary of Test Method

4.1 A test specimen of paper or paperboard is ignited in a muffle furnace at 525 or 900°C. A separate test specimen is analyzed for the percent moisture. The resulting weight of ash and moisture level in the sample are used to calculate the percent ash present at either of the specified temperatures on a moisture-free sample basis.

5. Significance and Use

5.1 The ash content of the sample may consist of various residues from chemicals used in its manufacture; metallic matter from piping and machinery; mineral matter in the pulp from which the paper was made; and filling, coating, pigmenting or other added materials. The amount and composition of the ash is a function of the presence or absence of any of these materials or others singly or in combination. No specific qualitative meaning is attached to the term “ash” as used in this test method. Where a further qualitative examination of the ash is desired, this method may be used in combination with Test Methods D 686, and major components of the ash identified.

5.2 Volatile decomposition products form from cellulose that is exposed to air at about 300°C. For papers or pulp containing no added fillers or coatings, ignition at *either* 525 or 900°C will yield essentially identical results of a few tenths percent ash or less. Examples of such papers include “ashless” filter papers manufactured for chemical analysis, or dissolving grade pulps.

5.3 Residue from cellulose products that contain oxides of silicon or titanium in fillers, coatings, or pigments may undergo negligible changes in weight when ignited at either 525 or 900°C. Where other fillers, pigments or coatings are known to be absent and where only silicon or titanium oxides are present, ignition at either temperature may be taken as a semi-quantitative measure of the percent of such material present in the sample.

5.4 In most cases, the ash content of paper and paperboard will contain inorganic residues from the pulp, inorganic residues from paper–making chemicals, and loading or filling materials deliberately added. In such cases, the significance of

[1] This test method is under the jurisdiction of ASTM Committee D06 on Paper and Paper Products and is the direct responsibility of Subcommittee D06.92 on Test Methods.

Current edition approved Dec. 10, 1997. Published November 1998. Originally approved in 1940. Last previous edition approved in 1996 as D 586 – 96.

[2] *Annual Book of ASTM Standards*, Vol 15.09.

[3] Available from the Technical Association of the Pulp and Paper Industry, P.O. Box 105113, Atlanta, GA 30348.