



Designation: D686 – 93 (Reapproved 2007)

An American National Standard

Standard Test Methods of Qualitative Examination of Mineral Filler and Mineral Coating of Paper¹

This standard is issued under the fixed designation D686; 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 These test methods cover two procedures for the qualitative determination and identification of the mineral constituents of filled and coated papers.

1.2 Due to the similarity in chemical composition and physical size and shape of some of the various possible constituents contained in a given paper specimen, more precise, quantitative methods may at times be required for positive identification.

1.3 It is recommended that one become thoroughly familiar with these test methods by analyzing paper samples of known mineral component content.

1.4 The test methods appear as follows:

Method A—Qualitative Chemical Analysis	Sections
Method B—Microscopical Identification	4 to 11
	12 to 19

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.*

NOTE 1—These test methods are technically equivalent to TAPPI T 421.

2. Referenced Documents

2.1 ASTM Standards:²

D585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Product

D586 Test Method for Ash in Pulp, Paper, and Paper Products³

¹ These test methods are under the jurisdiction of ASTM Committee D06 on Paper and Paper Products and are the direct responsibility of Subcommittee D06.92 on Standard Documents Relating to Paper and Paper Products.

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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³ Withdrawn.

D921 Discontinued 1980; Method of Test for Titanium Dioxide in Paper³

D1030 Test Method for Fiber Analysis of Paper and Paperboard

2.2 TAPPI Standards:⁴

T 401 Fiber analysis of paper and paperboard

T 438 Zinc and cadmium in paper and pigments

T 421 Qualitative (Including Optical Microscopic) Analysis of Mineral Filler and Mineral Coating of Paper

3. Significance and Use

3.1 Qualitative chemical analyses of the mineral component of a paper specimen, Test Method A, serve to identify the ions of any such minerals. The results may then be interpreted in terms of the minerals themselves. Direct identification of some of these minerals or their ions is frequently possible using optical microscopical examination, Test Method B. For additional information, see Annex A1.

3.2 The analysis can be considerably simplified if it is desired only to establish the presence or absence of a particular filler.

3.3 A microscopical examination of the ash usually proves to be a useful adjunct to chemical analysis, and if possible should be attempted (see Sections 12-18).

Test Method A—Qualitative Chemical Analysis

4. Apparatus

4.1 *Crucible*, platinum, with lid, for use in 9.7.1 and in ashing the sample that is being examined. Porcelain or silica crucibles may be used if their weight does not change under the ignition conditions.

4.2 *Muffle Furnace*, electric, controlled to maintain a temperature of $525 \pm 25^\circ\text{C}$.

4.3 *Laboratory Oven*, electric, controlled to maintain a temperature of $150 \pm 3^\circ\text{C}$.

4.4 *Blowpipe*.

4.5 *Wire Loop*, platinum.

⁴ Available from Technical Association of the Pulp and Paper Industry (TAPPI), 15 Technology Parkway South, Norcross, GA 30092, http://www.tappi.org.