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Standard Specification for Laboratory Filter Papers[1]

This standard is issued under the fixed designation E 832; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers two types of filter paper for use in chemical analysis and provides procedures for the complete evaluation of the filter papers.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D 774/D 774M Test Method for Bursting Strength of Paper

2.2 *TAPPI Standards:*[3]

T413 Ash in Paper

T429 Alpha-Cellulose in Paper

T509 Hydrogen Ion Concentration (pH) of Paper Extracts—Cold Extraction Method

3. Types and Classes

3.1 The types and classes of filter paper are as follows:

3.1.1 *Type I*—To be used for qualitative analysis (low ash content):

3.1.1.1 *Class AA*, for very coarse and gelatinous precipitates, very fast flow rate.

3.1.1.2 *Class A*, for coarse and gelatinous precipitates, fast flow rate.

3.1.1.3 *Class B*, for medium-size precipitates, medium flow rate.

3.1.1.4 *Class C*, for fine precipitates, slow flow rate.

3.1.1.5 *Class D*, hardened to facilitate scraping, for fine precipitates, slow flow rate.

3.1.2 *Type II*—to be used for quantitative analysis (ashless papers):

3.1.2.1 *Class E*, for coarse and gelatinous precipitates, fast flow rate.

3.1.2.2 *Class F*, for medium-size precipitates, medium flow rate.

3.1.2.3 *Class G*, for fine precipitates, slow flow rate.

4. Manufacture

4.1 The papers shall be made from such materials and by such methods as to ensure compliance with the requirements of Section 10, and shall be clean and free of imperfections that would affect their performance.

4.2 The papers shall be converted into circles, sheets, or any required sizes.

5. *General Requirements* General Requirements

5.1 All classes of filter paper shall comply with the requirements given in Table 1 and Table 2 and Section 11.

5.2 The ash content of the Type II circles shall not exceed 0.01 %.

5.3 Class D filter papers shall have a surface hard enough to permit scraping collected precipitates off the sheet.

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

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

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

TABLE 1 General Requirements

Property	Requirement
alphacellulose content, min, %	95
pH value	5.0 to 8.0

TABLE 2 Wet Bursting Strength

Class	Water Flow Rate and Retention of Precipitates		
	Wet Bursting Stength min, aug points	Maximum Water Flow Rate, aug, s	Retention of Precipitates—Filtrate Clear from:
AA	3.0	10	ferric hydroxide
A	3.0	20	ferric hydroxide
B	3.5	40	lead sulfate
C	4.0	150	barium sulfate
D	45.0	300	barium sulfate
E	3.0	20	ferric hydroxide
F	3.5	40	lead sulfate
G	4.0	150	barium sulfate

6. Sampling

6.1 If testing is required, the sample of each class shall be representative of the shipment, and specimens shall be taken at random from at least 3 % of the total packages.

7. Retests

7.1 If the results of the tests indicate noncompliance with the requirements of Table 1 and Table 2, or other factors described within this specification, take another representative sample of the shipment, selecting the specimens from different packages than those from which the first sample was taken.

7.2 Then test the second sample for compliance with this specification.

7.3 If the results of the retests indicate noncompliance with this specification, immediately consult the manufacturer for assistance in rectifying the problem.

8. Packaging and Marking

8.1 Flat circles of filter paper shall be packaged in units of 100 circles of the same diameter. Prefolded or fluted circles shall be packaged according to trade custom.

8.2 Each unit or package shall be marked with the manufacturer's name, size of circles, or catalog and lot number.

9. Test Methods

9.1 The most important tests to be performed are:

9.1.1 *pH Value*—Determine in accordance with TAPPI Method T 509.

9.1.2 *Alpha-Cellulose*—Determine in accordance with TAPPI Method T 429. This test may or may not be used for lot to lot determination.

9.1.3 *Ash Content*—Determine in accordance with Section 10.1 or TAPPI Method T 413, applicable for Type II papers.

9.1.4 Retention of precipitates, simple method to determine retention ability of filter paper as determined in accordance with 10.2.

9.1.5 *Water Flow Rate*—Determine the flow rates of filter paper in accordance with 10.3 or the Herzberg method (measurement of time for the filtration of 100 mL of prefiltered distilled water with a filter surface of 10 cm^2at a constant pressure of 50 mm water column).

9.1.6 *Wet Bursting Strength*—Determine in accordance with 10.4.

10. Test Methods

10.1 *Ash Content*:

10.1.1 *Apparatus*:

10.1.1.1 *Crucibles*, 20-mL platinum, with tightly fitting covers. One for each sample.

10.1.1.2 *Heat Source*—An electric muffle furnace with an operating temperature of approximately 925°C is recommended, but a gas burner yielding a similar temperature is sufficient.

10.1.1.3 *Test specimens*, having a mass of at least 6 g, representative of the sample obtained as prescribed in Section 6, and cut in the shape of whole circles of the same diameter or small strips measured for area.

10.1.2 *Procedure*: