



Standard Specification for Manifold Papers for Permanent Records¹

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1. Scope

1.1 This specification covers manifold papers used in preparing typewritten copies of permanent or semipermanent records and documents. The original, or ribbon, copy usually leaves the organization in which it originated, so the carbon copy becomes the copy of record.

1.2 It has been shown **(1, 2, 3, 4, 5)**² that permanence is at least an approximate function of the pH of an aqueous extract of the paper with correlation coefficients ranging from approximately 0.7 to 0.9 **(4)**. Three pH levels, reflecting three levels of permanence, are specified. Extract pH as an indicator of life expectancy is not valid if a paper has been treated with an alkaline surface size or if an alkaline coating has been applied.

1.3 The following would be expected to contribute significantly to the life expectancy of manifold papers: the use of papers with controlled acidity, or of papers manufactured under neutral or alkaline conditions, especially papers with a calcium carbonate filler that absorbs acidic gases from the atmosphere and can neutralize acidic materials formed in the aging of paper.

1.4 This specification is based on fiber sources used in the production of paper that contains no more than 1 % lignin, for papers used in archives, libraries, and other permanent records. However, under proper conditions, (see X1.5), paper containing more than 1 % lignin may be employed for many other end uses in paper for records that are required to have a substantial life expectancy.

1.5 As indicated in Appendices X1.4 and X1.5, this specification may be used as a guide.

2. Referenced Documents

2.1 ASTM Standards:

- D 585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, or Related Products³
- D 644 Test Method for Moisture Content of Paper and Paperboard by Oven Drying³
- D 646 Test Method for Grammage of Paper and Paperboard

(Weight per Unit Area)³

- D 985 Test Method Brightness of Pulp, Paper, and Paperboard (Directional Reflectance at 457 nm).
- D 1030 Test Method for Fiber Analysis of Paper and Paperboard³
- D 1968 Terminology Relating to Paper and Paper Products³
- D 2176 Test Method for Folding Endurance of Paper by the M.I.T. Tester³
- D 3424 Test Methods for Evaluating the Lightfastness and Weatherability of Printed Matter⁴
- D 4714 Test Method for Determination of Effect of Moist Heat (50 % Relative Humidity and 90°C) on Properties of Paper and Board³
- D 4988 Test Method for Determination of Alkalinity of Paper as Calcium Carbonate (Alkaline Reserve of Paper)³
- D 5625 Test Method for Measuring Length, Width and Squareness of Sheeted Paper and Paper Products³
- D 5634 Guide for the Selection of Permanent and Durable Offset and Book Papers³

2.2 TAPPI Standards:

- T 236 Kappa Number of Pulp⁵
- T 400 Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, or Related Products⁵
- T 401 Fiber Analysis of Paper and Paperboard⁵
- T 410 Grammage of Paper and Paperboard (Weight Per Unit Area)⁵
- T 411 Thickness (Caliper) of Paper and Paperboard⁵
- T 412 Moisture in Paper⁵
- T 414 Internal Tearing Resistance of Paper⁵
- T 452 Brightness of Pulp, Paper and Paperboard (Directional Reflectance at 457 nm)⁵
- T 509 Hydrogen Ion Concentration (pH) of Paper Extracts—Cold Extraction Method⁵
- T 511 Folding Endurance of Paper (MIT Tester)⁵
- T 544 Effect of Moist Heat on Properties of Paper and Board⁵

2.3 ISO Standards:

- ISO 9706 Paper for Documents. Specifications for Permanence. Normative Annex—Special instructions for determining kappa number.⁶

¹ This specification is under the jurisdiction of ASTM Committee D-6 on Paper and Paper Products and is the direct responsibility of Subcommittee D06.20 on Permanent Records Papers.

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² The boldface numbers in parentheses refer to the list of references at the end of this specification.

³ *Annual Book of ASTM Standards*, Vol 15.09.

⁴ *Annual Book of ASTM Standards*, Vol 06.02.

⁵ Available from the Technical Association of the Pulp and Paper Industry, P.O. Box 105113, Atlanta, GA 30348.

⁶ Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.