



Standard Test Methods for Wet Tensile Breaking Strength of Paper and Paper Products¹

This standard is issued under the fixed designation D 829; 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 measure the (wet) tensile breaking strength of paper, paper products, and paperboard (excluding corrugated board) when saturated with water.

1.2 These test methods are intended for use with papers and paper products that will be subjected to stress while wet during processing or use, including but not limited to tissue products, papers used in map-making, photography and blue prints, bags, and food wraps.

1.3 Two test methods are described; one for samples that are able to be handled while wet without damage, and one for samples, such as tissue, that are easily damaged or impossible to handle while wet.

1.4 *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 for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Products²

D 685 Practice for Conditioning Paper and Paper Products for Testing²

D 824 Test Method for Rate of Absorption of Water by Bibulous Papers²

D 828 Test Method for Tensile Properties of Paper and Paperboard Using Constant Rate of Elongation Apparatus²

D 1193 Specification for Reagent Water³

D 1968 Terminology Relating to Paper and Paper Products²

D 3285 Method for Water Absorptiveness of Nonbibulous Paper and Paperboard (Cobb Test)²

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process⁴

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology D 1968 or the *Dictionary of Paper*.⁵

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *finch wet strength, n*—tensile strength of a sample tested using Test Method B of these test methods.

4. Summary of Test Methods

4.1 These test methods consist of two test methods as follows:

4.1.1 *Test Method A*—Immersion Wetting Procedure, see 11.1.

4.1.2 *Test Method B*—Finch Procedure, see 11.2.

4.2 In Test Method A, a test specimen is immersed in distilled water at 23°C for the time period required to reach saturation as defined in these test methods that may be as long as 24 h. After saturation, the specimen is tested as described in Test Method D 828. Test Method A is suited for papers that can be handled wet without damage, including papers that retain a high percentage of their original (dry) strength when wet such as photographic, map, and blueprint papers, food wraps, and some bags.

4.3 In Test Method B, a test specimen is saturated with water in a Finch wet strength device and then tested as described in Test Method D 828. Test Method B is suited for papers that are highly absorbent, easily damaged when wet, or both, such as tissue paper, particularly absorbent towels. Saturation generally occurs in 5 to 40 s.

5. Significance and Use

5.1 Wet tensile strength is an important performance characteristic of papers or paper products that will be processed wet or that may be subjected to wetting, whether accidental or intentional, during use.

6. Apparatus

6.1 *Tensile Tester*—A tensile tester meeting the specifications found in Test Method D 828 is suitable for these test methods.

6.2 *Specimen Cutter*—A double blade strip cutter of the

¹ These test methods are under the jurisdiction of ASTM Committee D-6 on Paper and Paper Products and are the direct responsibility of Subcommittee D06.92 on Test Methods.

Current edition approved Dec. 10, 1997. Published November 1998. Originally published as D 829 – 45T. Last previous edition D 829 – 95.

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

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

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