This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D828 – 16ε1

# Standard Test Method for Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus[1]

This standard is issued under the fixed designation D828; 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 U.S. Department of Defense.*

ε[1] NOTE—Added missing "±" signs to 5.1.3 – 5.1.5, 5.4, and 8.1.6 editorially in June 2018.

## 1. Scope

1.1 This test method covers procedures for determining tensile properties of paper and paperboard.

1.2 The procedures given in this test method are for use with constant-rate-of-elongation tensile testing equipment and as such, are able to be used with instruments designed for either vertical or horizontal operation, and whether manually operated or computer controlled.

1.3 These procedures are applicable for all types of paper, paperboard, paper products, and related materials within the measurement limitations of the equipment used. They are not for use with combined corrugated board.

1.4 Properties able to be determined using this test method include tensile strength, stretch, tensile energy absorption, tensile stiffness, breaking length, and tensile index.

1.5 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

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

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*

D585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Product (Withdrawn 2010)[2]

D685 Practice for Conditioning Paper and Paper Products for Testing

D987 Test Method for Test for Stretch of Paper and Paper Products Under Tension (Withdrawn 1968)[2]

E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process

## 3. Terminology

3.1 *Definitions:* For definitions of terms used in this test method, refer to Terminology D1968 or the *Dictionary of Paper*[3].

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *line contact grips, n*—grips or jaws on a tensile testing machine having a clamping zone for gripping the specimen comprised of a cylindrical and a flat surface or two cylindrical surfaces whose axes are parallel

3.2.2 *paper, n*—planar structures deposited from an aqueous suspension that has a thickness less than 1 mm containing organic material, nonorganic material, or a combination of the two.

## 4. Significance and Use

4.1 The tensile properties measured in this test method are fundamental properties associated with the manufacture, or end use, or both, of paper and paper products. It is possible for the varity of products to be influenced by, or indicative of: the type fibers used or the treatment of the fibers, or both, in a particular

[1] This test method is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.01 on Electrical Insulating Products.

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[2] The last approved version of this historical standard is referenced on www.astm.org.

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

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