



# Standard Test Method for Coefficient of Static and Kinetic Friction of Uncoated Writing and Printing Paper by Use of the Horizontal Plane Method<sup>1</sup>

This standard is issued under the fixed designation D 4917; 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 This test method describes a horizontal plane procedure for the determination of the coefficient of static and kinetic friction of paper measured when sliding against itself.

1.2 Although this test method is basic in concept, the precision statement has been developed on uncoated writing and printing papers. While the use of this test method is recommended for those grades only, it may be used with other types of papers giving specific attention to special paper characteristics and with the understanding that the precision and bias may not be the same.

1.3 The horizontal instrument requires some means of movement of the specimen in relation to the surface upon which it rests. The coefficient of friction (COF) is measured directly from the resistance to tangential motion and the applied weight pressing two pieces of paper together.

1.4 Static COF relates to the force required to initiate movement between two surfaces while kinetic COF relates to the force required to cause continuation of the movement at uniform speed.

1.5 An inclined plane method is described in Test Method D 4918, which gives similar results for static COF but Test Method D 4918 cannot be used for the determination of kinetic COF. The choice of approach depends on the equipment available and the means of measurement.

1.6 The determination of this characteristic for corrugated and solid fiberboard is described in Test Methods D 4521 and D 3247. These test methods differ in that in Test Methods D 4521 and D 3247, the two specimens are allowed to slip upon one another three times before the force measurement is determined, while in this test method the determination is made on the first slip.

1.7 *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:<sup>2</sup>

D 528 Test Method for Machine Direction of Paper and Paperboard

D 585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Product

D 685 Practice for Conditioning Paper and Paper Products for Testing

D 725 Method for Identification of Wire Side of Paper<sup>3</sup>

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

D 1968 Terminology Relating to Paper and Paper Products

D 3247 Method of Test for Coefficient of Static Friction of Corrugated and Solid Fiberboard (Horizontal Plane Method)<sup>3</sup>

D 3460 Specification for White Watermarked and Unwatermarked Bond, Reprographic, and Laser Printer Cut-Sized Office Papers<sup>3</sup>

D 4521 Test Method for Coefficient of Static Friction of Corrugated and Solid Fiberboard<sup>3</sup>

D 4918 Test Method for Coefficient of Static Friction of Uncoated Writing and Printing Paper by Use of the Inclined Plane Method

E 122 Practice for Calculating Sample Size to Estimate, With a Specified Tolerable Error, the Average for a Characteristic of a Lot or Process

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D06 on Paper and Paper Products and is the direct responsibility of Subcommittee D06.92 on Standard Documents Relating to Paper and Paper Products.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Withdrawn.