



Standard Test Method for Air Permeability of Textile Fabrics¹

This standard is issued under the fixed designation D 737; 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 covers the measurement of the air permeability of textile fabrics.

1.2 This test method applies to most fabrics including woven fabrics, nonwoven fabrics, air bag fabrics, blankets, napped fabrics, knitted fabrics, layered fabrics, and pile fabrics. The fabrics may be untreated, heavily sized, coated, resin-treated, or otherwise treated.

1.3 The values stated in SI units are to be regarded as the standard. The values stated in inch-pound units may be approximate.

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 123 Terminology Relating to Textiles²

D 1776 Practice for Conditioning Textiles for Testing²

D 2904 Practice for Interlaboratory Testing of a Textile Test Method That Produces Normally Distributed Data²

D 2906 Practice for Statements on Precision and Bias for Textiles²

F 778 Methods for Gas Flow Resistance Testing of Filtration Media³

2.2 ASTM Adjuncts:

TEX-PAC⁴

NOTE 1—TEX-PAC is a group of programs on floppy disks available through ASTM Headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

3. Terminology

3.1 Definitions—For definitions of other textile terms used

¹ This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.59 on Fabric Test Methods, General.

Current edition approved Feb. 10, 1996. Published April 1996. Originally published as D 737 – 43 T. Discontinued November 1995 and reinstated as D 737 – 96.

² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ A PC program on floppy disk for Analyzing Committee D-13 interlaboratory data are available from ASTM Headquarters. For a 3½-in. disk, request PCN:12-429040-18. For a 5¼-in. disk, request PCN:12-429041-18.

in this test method refer to Terminology D 123.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *air permeability, n*—the rate of air flow passing perpendicularly through a known area under a prescribed air pressure differential between the two surfaces of a material.

3.2.1.1 *Discussion*—Air permeability of fabric at a stated pressure differential between two surfaces of the fabric is generally expressed in SI units as cm³/s/cm² and in inch-pound units as or ft³/min/ft² calculated at operating conditions.

3.2.2 *cross-machine direction, CD, n*—the direction in the plane of the fabric perpendicular to the direction of manufacture.

3.2.2.1 *Discussion*—This term is used to refer to the direction analogous to coursewise or filling direction in knitted or woven fabrics, respectively.

3.2.3 *fabric, in textiles, n*—a planar structure consisting of yarns or fibers.

3.2.4 *machine direction, MD, n*—the direction in the plane of the fabric parallel to the direction of manufacture.

3.2.4.1 *Discussion*—This term is used to refer to the direction analogous to warpwise or warp direction in knitted or woven fabrics, respectively.

4. Summary of Test Method

4.1 The rate of air flow passing perpendicularly through a known area of fabric is adjusted to obtain a prescribed air pressure differential between the two fabric surfaces. From this rate of air flow, the air permeability of the fabric is determined.

5. Significance and Use

5.1 This test method is considered satisfactory for acceptance testing of commercial shipments since current estimates of between-laboratory precision are acceptable, and this test method is used extensively in the trade for acceptance testing.

5.1.1 In case of a dispute arising from differences in reported test results when using this test method for acceptance testing of commercial shipments, the purchaser and the supplier should conduct comparative tests to determine if there is a statistical bias between their laboratories. Competent statistical assistance is recommended for the investigation of bias. As a minimum, the two parties should take a group of test specimens that are as homogeneous as possible and that are from a lot of material of the type in question. Test specimens then should be randomly assigned in equal numbers to each laboratory for testing. The average results from the two