



Designation: D5665/D5665M – 99a (Reapproved 2021)

# Standard Specification for Thermoplastic Fabrics Used in Cold-Applied Roofing and Waterproofing<sup>1</sup>

This standard is issued under the fixed designation D5665/D5665M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers thermoplastic fabrics such as polyester, polyester/polyamide bicomponent, or composites with fiberglass or polyester scrims that can be used during the construction of cold-applied roofing and waterproofing.

1.2 This specification is intended as a material specification. Issues regarding the suitability of specific roof constructions or application techniques are beyond the scope of this specification.

1.3 The specified tests and property values used to characterize the respective fabrics are intended to establish minimum properties. In-place system design criteria or performance attributes are factors beyond the scope of this material specification.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.5 *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:*<sup>2</sup>

[D123 Terminology Relating to Textiles](#)

[D1079 Terminology Relating to Roofing and Waterproofing](#)

[D1117 Guide for Evaluating Nonwoven Fabrics](#) (Withdrawn 2009)<sup>3</sup>

[D1776/D1776M Practice for Conditioning and Testing Textiles](#)

[D1777 Test Method for Thickness of Textile Materials](#)

[D4830/D4830M Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing](#)

[D5035 Test Method for Breaking Force and Elongation of Textile Fabrics \(Strip Method\)](#)

[D5733 Test Method for Tearing Strength of Nonwoven Fabrics by the Trapezoid Procedure](#) (Withdrawn 2008)<sup>3</sup>

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminologies [D123](#) and [D1079](#).

## 4. Classification

4.1 The thermoplastic fabrics covered by this specification are of the following general constructions and compositions. Each is a separate class or type differentiated by the polymer type, combination of polymers, manufacturing process, or some combination thereof.

4.1.1 *Type I*—Polyester spunbonded without resin, unneeded;

4.1.2 *Type II*—Polyester spunbonded without resin, needed;

4.1.3 *Type III*—Polyester mat plus fiber glass scrim with resin;

4.1.4 *Type IV*—Polyester core/polyamide sheath bicomponent spunbonded;

4.1.5 *Type V*—Polyester mat with polyester stitching;

4.1.6 *Type VI*—Polyester mat plus polyester scrim with resin; and

4.1.7 *Type VII*—Polyester scrim fabric with resin.

## 5. Materials and Manufacture

5.1 The fabric shall be a uniform, thin, porous mat of the primary thermoplastic polymer, with or without the addition of reinforcing stranded glass or thermoplastic yarns. Chemically

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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> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

bonding with a water-resistant resin or thermally bonding with other thermoplastic polymers shall be permitted.

## 6. Physical Properties, Thickness, and Mass

6.1 Fabrics shall conform to the thickness, mass, and physical properties presented in [Table 1](#).

## 7. Unit Mass

7.1 Determine the unit mass of the fabric using the procedures described in [Guide D1117](#).

## 8. Workmanship, Finish, and Appearance

8.1 The finished material shall be free of visible defects such as ragged or untrue edges, folds, creases, wrinkles, tears, and holes.

## 9. Sampling

9.1 Sample the material and determine the properties enumerated in this specification in accordance with the test procedures referenced herein (also see [Practice D1776/D1776M](#)).

## 10. Thickness

10.1 Determine the thickness of the fabric using the procedures described in [Test Method D1777](#).

## 11. Breaking Load and Elongation

11.1 Determine the breaking load and elongation by the cut strip method as described in [Test Methods D4830/D4830M](#) and [D5035](#). The preferred SI unit for breaking load is kN/m.

## 12. Trapezoid Tearing Strength

12.1 Determine the trapezoid tearing strength using the procedures described in [Test Method D5733](#).

## 13. Puncture Strength

13.1 Determine the puncture strength using the procedures described in [Test Methods D4830/D4830M](#).

## 14. Inspection

14.1 *Inspection*—Inspection shall be in accordance with the requirements of this specification.

14.2 *Inspection Alternatives*—Alternative inspection requirements shall be determined by and as agreed upon between the purchaser and the supplier.

## 15. Rejection and Resubmittal

15.1 *Failure to Conform*—Failure to conform to any of the requirements as stated in this specification constitutes grounds for rejection.

15.2 *Rejection Redress*—The supplier shall have the right to inspect the rejected materials. The supplier and the purchaser shall agree to the quantity of rolls deemed unacceptable. The supplier shall then have the right to submit the same number of new rolls as replacement.

## 16. Packaging and Package Marking

16.1 The rolls shall be wrapped or banded securely with a substantial grade of paper, plastic wrap, or taping that encircles the roll in a manner that will prevent slipping or unraveling.

16.2 No roll shall contain more than two pieces, and no more than 3 % of the rolls in any lot (pallet or shipment) shall contain two pieces. Pieces represent roll ends that can be one of the following: (1) individual and loose, (2) adhered, or (3) stitched to appear as one continuous piece. These rolls must be marked clearly with a red tag or other item to identify the location of the splice.

16.3 Unless otherwise specified, each package shall be marked plainly with the manufacturer's or supplier's name, product or brand name, or both, and the ASTM designation and type.

## 17. Keywords

17.1 cold-applied roofing and waterproofing; fiber glass scrim; polyester/polyamide reinforcement; polyester reinforcement; thermoplastic fabrics

**TABLE 1 Physical Properties of Thermoplastic Fabrics for Use In Cold-Applied Roofing and Waterproofing**

Properties	Types						
	I	II	III	IV	V	VI	VII
Unit mass, nominal, g/m <sup>2</sup> , [oz/yd <sup>2</sup> ] [lb/100 ft <sup>2</sup> ]	51 [1.5] [1.0]	119 [3.5] [2.4]	125 [3.7] [2.6]	75 [2.2] [1.5]	125 [3.7] [2.6]	73 [2.1] [1.5]	58 [1.7] [1.2]
Thickness, mm [mils], min	0.21 [8.3]	1.22 [48]	0.41 [16]	0.56 [22]	0.28 [11]	0.12 [4.7]	0.10 [4.0]
Breaking load, kN/m [lbf/in.], min, machine direction (MD) and crossmachine direction (CD)	1.6 [9]	4.6 [26]	20.5 [117]	4.2 [24]	5.6 [32]	7.0 [40]	6.5 [37]
Elongation, %, min, MD and CD	32	50	3.3	24	17	15	14
Trapezoid tearing strength, N [lbf], min, MD and CD	71 [16]	142 [32]	31 [7]	125 [28]	36 [8]	44 [10]	76 [17]
Puncture strength, N [lbf], min	102 [23]	187 [42]	53 [12]	98 [22]	329 [74]	49 [11]	49 [11]