Designation: D579/D579M – 24

# Standard Practice for Greige Woven Glass Fabrics[1]

This standard is issued under the fixed designation D579/D579M; 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.*

## 1. Scope

1.1 This practice covers greige fabrics woven from "E" electrical glass fiber yarns. This practice can also be applied to fabrics made of other glass fiber types as agreed upon between the purchaser and the supplier.

1.2 This practice specifies the terminology, definitions, general requirements and physical requirements for greige glass fiber fabrics. This practice permits the application of organic materials to the glass fiber yarn during manufacture that helps facilitate weaving.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

1.4 This practice is one of a series to provide a substitute for Military Specifications: MIL-Y-1140 Yarn, Cord, Sleeving, Cloth, and Tape-Glass and MIL-C-9084 Cloth, Glass Finished for Resin Laminates.

1.5 Additional ASTM practices in this series have been drafted and appear in current editions of the Annual Book of ASTM Standards. These include finished glass fabrics, unfinished glass fabrics, glass tapes, glass sleevings, glass cords, glass sewing threads, and finished laminates made from finished glass fabrics.

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:*[2]

D123 Terminology Relating to Textiles
D578/D578M Specification for Glass Fiber Strands
D579/D579M Specification for Greige Woven Glass Fabrics
D1059 Test Method for Yarn Number Based on Short-Length Specimens
D1423/D1423M Test Method for Twist in Yarns by Direct-Counting
D1776/D1776M Practice for Conditioning and Testing Textiles
D1777 Test Method for Thickness of Textile Materials
D3773/D3773M Test Methods for Length of Woven Fabric
D3774 Test Method for Width of Textile Fabric
D3775 Test Method for End (Warp) and Pick (Filling) Count of Woven Fabrics
D3776/D3776M Test Methods for Mass Per Unit Area (Weight) of Fabric
D4963/D4963M Test Method for Ignition Loss of Glass Fiber Strands and Fabrics
D5035 Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
D7018/D7018M Terminology Relating to Glass Fiber and Its Products (Withdrawn 2021)[3]

2.2 *ANSI Standards:*

ANSI/ASQC Z1.4 Sampling Procedures for Inspection by Attributes[4]

2.3 *Military Standard and Specifications:*

MIL-Y-1140H Yarn, Cord, Sleeving, Cloth and Tape-Glass[5]
MIL-C-9084C Cloth, Glass Finished for Resin Laminates[5]

[1] This specification is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.18 on Glass Fiber and its Products.

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

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

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[5] Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, http://quicksearch.dla.mil.

2.4 *Textile Institute Documents:*
Textile Terms and Definitions[6]
Woven Cloth Construction[6]

## 3. Terminology

3.1 For all terminology relating to D13.18, Glass Fibers and Its Products, refer to Terminology D7018/D7018M.

3.1.1 The following terms are relevant to this specification: atmosphere for testing textiles, continuous filament, crowfoot weave, eight-harness satin, greige goods, leno weave, mock leno weave, twelve-harness satin.

3.2 For all other terms related to textiles, see Terminology D123.

## 4. Significance and Use

4.1 This practice lists physical properties of typical 'E" glass greige woven glass fabrics by commercial style designation that details fabric count, yarn specifications in tex, fabric weave type, mass per unit area, thickness and breaking force.

4.1.1 The fabric weave type is important. It can affect the performance of the final product depending on its end use in terms of force, durability and aesthetics. This practice details how to recognize specified weaves such as crowfoot, plain, leno, mock leno, eight-harness satin and twelve-harness satin.

4.1.2 This practice also details a method to classify of major and minor fabric defects by appearance. This method for determining fabric appearance is extensively used in trade and considered satisfactory for acceptance testing of commercial shipments. In case of disagreement arising from differences in values reported by the purchaser and the supplier when using this method for acceptance testing, the statistical bias, if any, between the examination station of the purchaser and the examination station of the supplier should be determined with each comparison being based on the examination results of inspection of the same rolls of fabric.

## 5. Classification

5.1 The designation of a fabric should be by style numbers that are standard throughout the industry. Generally used style numbers are listed in numerical order in Table 8.

[6] Available from the Textile Institute, 10 Blackfriars St., Manchester, M3 5DR England.

**TABLE 1 Twist Tolerances**

| | Tolerances |
|---|---|
| Turns per Centimeter: | |
| From zero to 0.4, incl | ±0.1 turn per centimeter |
| Over 0.4 and up to and including 4.0 | ±0.2 turn per centimeter |
| Over 4 | ±5.0 % of the specified average twist |
| Turns per Meter: | |
| From zero to 40, incl | ±10 turns per meter |
| Over 40 and up to and including 400 | ±20 turns per meter |
| Over 400 | ±5.0 % of the specified average twist |
| Turns per Inch: | |
| From zero to 1, incl | ±0.25 turn per inch |
| Over 1 and up to and including 10 | ±0.5 turn per inch |
| Over 10 | ±5.0 % of the specified average twist |

**TABLE 2 Tolerances—Mass/Unit Area**

| Nominal Mass/Unit Area, $g/m^2$ [$oz/yd^2$] | Permissible Variation, % |
|---|---|
| 136 [4.0] and under | ±10 |
| Over 136 [4.0] | ±6 |

**TABLE 3 Tolerances—Thickness**

| Nominal Thickness | Permissible Variations |
|---|---|
| millimeters | |
| 0.075 and under | ±0.013 |
| Over 0.075 to 0.250 | ±0.025 |
| Over 0.250 to 0.380 | ±0.050 |
| Over 0.380 | ±0.075 |
| inches | |
| 0.0030 and under | ±0.0005 |
| Over 0.0030 to 0.0100 | ±0.0010 |
| Over 0.0100 to 0.0150 | ±0.0020 |
| Over 0.0150 | ±0.0030 |

## 6. Requirements

The designation of a fabric should be by style numbers that are standard throughout the industry. Generally used style numbers are listed in numerical order in Table 8.

## 7. Material

7.1 The yarn should be continuous filament, unless otherwise specified, free of any free alkali metal salts, such as soda or potash, and foreign particles, dirt, and other impurities.

7.2 Accept the supplier's certification that the material is of the correct grade as specified in Specification D578/D578M. Unless otherwise specified, during testing for strand construction as directed in Section 10, verify that the yarn is continuous filament. Determine the freedom from objectionable impurities during the inspection for fabric appearances as directed in Section 22.

## 8. Fabric Count

8.1 For fabrics listed in Table 8, the nominal fabric count should conform to the requirements of Table 8. For fabrics not listed in Table 8, the nominal fabric count should be agreed upon between the purchaser and the supplier. The average count of warp ends should be within two ends of the nominal count, and the average count of the filling picks should be within two picks of the nominal count.

## 9. Yarn Designations

9.1 For fabrics listed in Table 8, the yarn designations should conform to the requirements of Table 8. For fabrics not listed in Table 8, the yarn designations should be agreed upon between the purchaser and the supplier. The requirements of the individual elements of the designation are specified in Sections 10 – 14.

9.1.1 In some cases ECE 225 yarn is specified in Table 8. ECD 225 may be substituted with no significant decrease in property performance.