



Standard Test Method for Tensile Properties of Glass Fiber Strands, Yarns, and Rovings Used in Reinforced Plastics¹

This standard is issued under the fixed designation D 2343; 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 determination of the comparative tensile properties of glass fiber strands, yarns, and rovings in the form of impregnated rod test specimens when tested under defined conditions of pretreatment, temperature, humidity, and tension testing machine speed. This test method is applicable to continuous filament, glass fiber materials that have been coated with a resin compatible sizing. This method is intended for use in quality control and R & D, and should not be used to develop composites design data.

NOTE 1—This method is technically equivalent to the short method described in ISO 9163.

NOTE 2—Prime consideration should be given to the use of a polymeric binder that produces specimens that yield the highest consistent values for the glass fiber material under test. Tensile properties may vary with specimen preparation, resin impregnation system, and speed and environment of testing. Consequently, where precise comparative results are desired, these factors must be carefully controlled.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

NOTE 3—Prime consideration should be given to the use of a polymeric binder that produces specimens that yield the highest consistent values for the glass fiber material under test. Tensile properties may vary with specimen preparation, resin impregnation system, and speed and environment of testing. Consequently, where precise comparative results are desired, these factors must be carefully controlled.

1.3 *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:²

- D 618 Practice for Conditioning Plastics for Testing
- D 883 Terminology Relating to Plastics
- D 3039/D 3039M Test Method for Tensile Properties of Polymer Matrix Composite Material
- D 5083 Test Method for Tensile Properties of Reinforced Thermosetting Plastics Using Straight-Sided Specimens
- E 4 Practices for Force Verification of Testing Machines
- E 6 Terminology Relating to Methods of Mechanical Testing

3. Terminology

3.1 Definitions:

3.1.1 Definitions of terms and symbols relating to this test method appear in Terminologies E 6 and D 883.

4. Summary of Test Method

4.1 This test method consists of impregnating glass fiber strands, yarns, or rovings with a suitable polymeric binder material and loading the resulting test specimens to failure in a tension testing machine having a constant-rate-of crosshead movement. The cross sectional area is determined from skeins of glass fiber taken before and after each set of test specimens. After impregnation and curing, the specimens shall either be tabbed using glass fiber mat or cardboard and tested with standard grips; or the ends shall be sanded with 240 grit sandpaper or fine emory cloth and tested using rubber faced grips.

5. Significance and Use

5.1 Tensile properties determined by this test method are of value for identifying and characterizing materials for control and specification purposes as well as for providing data for research and development studies.

5.2 This test method is intended for use in testing resin-compatible sized glass fiber materials that have been designed

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.18 on Reinforced Thermosetting Plastics.

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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.