



Designation: D8132/D8132M – 23

Standard Test Method for Determination of Prepreg Impregnation by Permeability Measurement¹

This standard is issued under the fixed designation D8132/D8132M; 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 determines the in-plane permeability of composite prepreg (pre-impregnated) materials as a measure of level of impregnation. Permissible prepreg materials include those reinforced with carbon, glass, aramid, thermoplastic and other fibers impregnated with a thermoset or thermoplastic matrix resin, creating a single ply sheet material. The reinforcements may be unidirectional or woven fabrics.

1.2 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.

1.2.1 Within the text, the inch-pound units are shown in brackets.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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:*

D883 Terminology Relating to Plastics

D3878 Terminology for Composite Materials

E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E456 Terminology Relating to Quality and Statistics

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—Terminology D3878 defines terms relating to high-modulus fibers and their composites. Terminology D883 defines terms relating to plastics. Terminology E456 and Practice E177 define terms relating to statistics. In the event of a conflict between terms, Terminology D3878 shall have precedence over the other terminologies.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *as cast*—pertaining to the transparent and smooth surface of an acrylic block.

3.2.2 *acrylic block assembly*—the acrylic blocks nested together or clamped together but that are otherwise oriented or joined together only for a temporary process.

3.2.3 *cut side*—machined surface of an acrylic block.

3.2.4 *permeability*—material property that determines flow through a porous medium. Within this standard, used to determine the air transport of prepreg materials in the in-plane directions.

3.2.5 *permeability test apparatus*—the vacuum test chamber with known volume where the permeability test specimen is mounted and tested to determine permeability.

3.2.6 *permeability test specimen*—specimen prepared for the permeability test.

3.3 *Symbols*

A = cross-sectional area of the prepreg test specimen

CV = coefficient of variation of a sample population for a given property (in percent)

FAW = fiber areal weight

H = prepreg thickness

ID = inner diameter

K = permeability

K_n = normalized permeability (independent of prepreg thickness)

L = length of prepreg sample

OD = outer diameter

¹ This test method is under the jurisdiction of ASTM Committee D30 on Composite Materials and is the direct responsibility of Subcommittee D30.03 on Constituent/Precursor Properties.

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