



Designation: D8387/D8387M – 23

## Standard Test Method for High Bypass – Low Bearing Interaction Response of Polymer Matrix Composite Laminates<sup>1</sup>

This standard is issued under the fixed designation D8387/D8387M; 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 test method determines the uniaxial high bypass – low bearing interaction response of multi-directional polymer matrix composite laminates reinforced by high-modulus fibers using a two-fastener hard point joint specimen. The scope of this test method is limited to net section (bypass) failure modes. Standard specimen configurations using fixed values of test parameters are described for this procedure. A number of test parameters may be varied within the scope of the standard, provided that the parameters are fully documented in the test report. The composite material forms are limited to continuous-fiber or discontinuous-fiber (tape or fabric, or both) reinforced composites for which the laminate is balanced and symmetric with respect to the test direction. The range of acceptable test laminates and thicknesses are described in [8.2.1](#). This test method was previously published under Test Method [D7248/D7248M-17](#) Procedure C.

1.2 This test method is consistent with the recommendations of Composite Materials Handbook, CMH-17, which describes the desirable attributes of a bearing/bypass interaction response test method.

1.3 The two-fastener test configurations described in this test method are intended to provide data in the relatively high bypass, low bearing part of the composite bolted joint bearing-bypass interaction diagram. This data complements the data from filled hole tension and compression (Practice [D6742/D6742M](#)), bearing (Test Method [D5961/D5961M](#)), and low bypass/high bearing interaction (Test Method [D7248/D7248M](#)) tests.

1.4 This test method requires careful specimen design, instrumentation, data measurement, and data analysis. The use of this test method requires close coordination between the test requestor and the test lab personnel. Test requestors need to be familiar with the data analysis procedures of this test method

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee [D30](#) on Composite Materials and is the direct responsibility of Subcommittee [D30.05](#) on Structural Test Methods.

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and should not expect test labs who are unfamiliar with this test method to be able to produce acceptable results without close coordination.

1.5 *Units*—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.

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

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:<sup>2</sup>

- [D792 Test Methods for Density and Specific Gravity \(Relative Density\) of Plastics by Displacement](#)
- [D883 Terminology Relating to Plastics](#)
- [D2584 Test Method for Ignition Loss of Cured Reinforced Resins](#)
- [D2734 Test Methods for Void Content of Reinforced Plastics](#)
- [D3171 Test Methods for Constituent Content of Composite Materials](#)
- [D3878 Terminology for Composite Materials](#)
- [D5229/D5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials](#)

<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.