



Standard Test Method for Determining Seam Strength in Inflatable Restraint Cushions¹

This standard is issued under the fixed designation D 5822; 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 measurement of seam efficiency and the maximum seam strength in inflatable restraint cushions composed of woven fabrics when a force is applied perpendicular to the seam, using a grab test. For evaluating sewing thread, refer to Test Method D 204.

1.2 This test method is restricted to seams that are obtained from an inflatable restraint cushion. Seams may include but are not limited to sewn, OPW, glued, fused (chemically or thermally).

1.3 This test method is used when the measurement of a resistance to a specified force, a breaking force, a minimum elongation, or a combination thereof are required to determine the seam strength, or seam integrity of a particular fabric for inflatable restraint use.

1.4 Procedures and apparatus other than those stated in this standard may be used by agreement between purchaser and supplier with the specific deviations from the standard acknowledged in the report.

1.5 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 exact equivalents; therefore, each system must be used independently of the other.

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

2. Referenced Documents

2.1 ASTM Standards:²

D 123 Terminology Relating to Textiles

D 204 Test Methods for Sewing Threads

D 1776 Practice for Conditioning and Testing Textiles

D 3990 Terminology Relating to Inflatable Restraints

3. Terminology

3.1 Definitions:

3.1.1 *seam efficiency, n —in inflatable restraints*, the ratio of seam strength to fabric strength.

3.1.2 *seam failure, n —in inflatable restraints*, the point at which an external force ruptures a seam assembly or the fabric, or causes excessive yarn slippage adjacent to the seam assembly.

3.1.3 *seam strength, n —in inflatable restraints*, the maximum force required to create a seam failure.

3.2 For definitions of textile terms relating to inflatable restraints used in this standard, refer to Terminology D 3990.

3.3 For definitions of other textile terms used in this standard, refer to Terminology D 123.

4. Summary of Test Method

4.1 Specimens with and without seam assemblies taken from inflatable restraint cushions are destructively tested in a tensile testing machine under laboratory conditions to determine seam strength and seam efficiency.

5. Significance and Use

5.1 Seam strength testing is used for design validation and for lot acceptance.

5.2 This test method constitutes the conditions, procedures, and equipment by which inflatable restraints are tested for seam strength and seam efficiency. It is intended to be used as a guideline in establishing a written part specification or print. The specification or agreement of purchaser and supplier may deviate from the procedures described herein when (based on experience) considerations of equipment, cushion design, or other factors dictate otherwise.

5.3 In cases of dispute arising from differences in reported test results when using this test method for acceptance testing of commercial shipments, the purchaser and the supplier should perform comparative tests to determine if there is a statistical bias between their laboratories. Competent statistical assistance is recommended for the investigation of bias. As a minimum, the two parties should take a group of test specimens from the same lot of fabric to be evaluated, which utilize a like seam assembly (or standard seam assembly) to achieve

¹ This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.20 on Inflatable Restraints.

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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.