Designation: D 5807 – 95

Standard Practice for Evaluating the Overpressurization Characteristics of Inflatable Restraint Cushions[1]

This standard is issued under the fixed designation D 5807; 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 practice covers the procedures and conditions used to evaluate the physical performance of inflatable restraint cushions during and after overpressurization testing at elevated pressures capable of causing cushion bursting using air pressurization equipment.

1.2 The physical performance characteristics that may be obtained in conjunction with this practice are internal cushion pressures determined by instrumentation and material integrity, determined by visual inspection.

1.3 This practice is applicable to driver-side inflatable restraint cushions only.

1.4 Procedures and apparatus other than those stated in this practice may be used by agreement between purchaser and supplier with the specific deviations from this practice 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.* See Section 8 for specific hazard information.

2. Referenced Documents

2.1 *ASTM Standards:*

D 123 Terminology Relating to Textiles[2]

3. Terminology

3.1 *Definitions:*

3.1.1 *cushion, n—for inflatable restraints*, the inflatable fabric envelope portion of a module.

3.1.2 *cushion overpressurization, n—for inflatable restraints*, the process of inflating a cushion at internal pressures greater than design deployment pressures; bag burst.

3.1.3 *deployment, n—for inflatable restraints*, the sequence of events related to the activation of a module.

3.1.4 *inflatable restraint, n*—a vehicular safety device designed to cushion an occupant or equipment during collision; airbag.

3.1.5 *module, n—for inflatable restraints*, an assembly composed of an inflator, a cushion, a mounting device, a trigger, and a cover.

3.1.6 *standard atmosphere for testing textiles, n*—an atmosphere for testing in which the air is maintained at a relative humidity of 65 ± 2 % and at a temperature of 21 ± 1°C (70 ± 2°F).

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

4. Summary of Practice

4.1 Inflatable restraint cushions are tested under laboratory conditions to evaluate cushion integrity when exposed to internal cushion pressures greater than deployment pressures. If cushion rupture occurs, the rupture pressure, time to rupture, and mode of rupture are recorded.

4.2 Inflatable restraint cushions are mounted into a test stand that allows for deployments under conditions that exceed deployment pressures. Instrumentation within the test stand charts inflation pressures versus time and may allow for photographic review of the overpressurization sequence.

4.3 Cushion overpressurization results are reviewed for pressure and time relationships, and post-inflation material analysis.

5. Significance and Use

5.1 This practice is intended to be a general guideline for repetitive testing, safe conduct of tests, and accurate data collection for inflatable restraints. Cushion overpressurization testing may be used for design and production validation, for manufacturing process control, for lot acceptance, or for a combination thereof.

5.2 This practice constitutes the conditions, apparatus, and procedures by which driver-side inflatable restraints are commonly tested for cushion overpressurization. It is intended to be used as a guideline in establishing a cushion specification or equivalent document. The practices in the specification may deviate from the practices described herein when (based on experience) considerations of equipment, cushion design, or other factors dictate otherwise.

5.3 There exists a large variety in cushion configurations

[1] This practice is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.20 on Inflatable Restraints.

Current edition approved Sept. 10, 1995. Published February 1996.

[2] *Annual Book of ASTM Standards*, Vol 07.01.