



Standard Practice for Evaluating the Performance of Inflatable Restraint Modules¹

This standard is issued under the fixed designation D 5428; 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 describes the procedures and conditions used to evaluate the physical performance of inflatable restraint modules and module components during and after deployment.

1.2 The physical performance characteristics that may be obtained by this practice are internal cushion pressures determined by instrumentation, cushion geometries determined by high-speed photography, and material integrity determined by visual inspection.

1.3 This practice is applicable to driver and passenger side inflatable restraint modules.

1.4 Procedures and apparatus other than those stated in this practice may be used by agreement between the purchaser and the supplier with the specific deviations from the 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 independent 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:

D 123 Terminology Relating to Textiles²

D 6799 Terminology Relating to Inflatable Restraints³

2.2 Federal Standard:⁴

CFR 49 Code of Federal Regulations

2.3 SAE Standard:⁵

J211 Instrumentation for Impact Test

3. Terminology

3.1 Definitions:

3.2 For definitions of other terms used in this standard, refer to Terminology D 123 and Terminology D 6799.

4. Summary of Practice

4.1 Inflatable restraint modules are mounted into a test stand that allows for deployments under conditions that duplicate or closely resemble the conditions in a vehicle.

4.2 Instrumentation within the test stand charts inflation pressures versus time. High-speed photography visually captures changing cushion geometries over time.

4.3 Module deployments are reviewed for pressure and time relationships, cushion geometries at one or more times during the cycle, 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.

5.2 This practice may be used by the purchaser and the supplier to establish the criteria by which inflatable restraint modules will be tested by the supplier to determine whether a lot of material is acceptable for shipment to the purchaser.

5.3 Unless otherwise specified by agreement between the purchaser and the supplier, this practice shall constitute the test conditions, procedures, and equipment by which inflatable restraint modules are deployed for testing. It is intended to be used as a guideline in establishing a written material specification or equivalent agreement between the purchaser and the supplier. The specification may deviate from the practices described herein when (based on experience) considerations of fabric properties, material handling equipment, or inflatable restraint system design dictate otherwise.

6. Interferences

6.1 The pressure transducer and pickup tube must be mounted in a position which does not interfere with the unfolding cushion.

6.2 The pressure versus time data is subject to recording anomalies and electronic noise. The data should be digitally

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

Current edition approved April 10, 2002. Published June 2002. Originally published as D 5428 – 93. Last previous edition D 5428 – 93a.

² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 07.02.

⁴ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20525.

⁵ Available from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001.