



Standard Test Method for Impact Attenuation of Playing Surface Systems, Other Protective Sport Systems, and Materials Used for Athletics, Recreation and Play¹

This standard is issued under the fixed designation F355; 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.

ε¹ NOTE—Editorially corrected A1.9 in December 2016.

1. Scope

1.1 This test method measures the impact attenuation of surface systems and materials, specifically the peak impact acceleration (“impact shock”) produced under prescribed impact conditions.

1.2 This test method is applicable to natural and artificial surface systems intended to provide impact attenuation, including natural and artificial turf sports fields.

1.3 This test method is applicable to impact attenuating mats and padding used in sports facilities, including stadium wall padding, gymnastic mats, wrestling mats, turf playing systems, pole vault landing systems, playground protective surfacing, and other systems.

1.4 This test method is used to measure the impact attenuation of materials and components used as protective padding on trampoline frames, goal posts, etc., provided the material or component can be tested separately from the equipment to which it is attached.

1.5 Without modifications, this test method shall not be used to test materials and components that are attached to structures or equipment or finished products, unless the impact attenuation of the whole system is of interest.

1.6 While it is widely believed that appropriate impact attenuation can reduce the risk of impact-related injuries, the relationships between the results of this test method and specific injury risk and outcomes have not been determined.

1.7 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.8 *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

D1596 Test Method for Dynamic Shock Cushioning Characteristics of Packaging Material

E105 Practice for Probability Sampling of Materials

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

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

F1292 Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment

F2650 Terminology Relating to Impact Testing of Sports Surfaces and Equipment

2.2 SAE Standard:

SAE J2111/1 Instrumentation for Impact Tests - Part 1 - Electronic Instrumentation (rev. July 2007)³

3. Terminology

3.1 Definitions of terms related to impact testing of sports surfaces equipment can be found in Terminology F2650, except as noted.

3.2 Definitions:

3.2.1 *HIC interval, n*—the time interval within the acceleration-time history of an impact over which the HIC integral is evaluated.

3.2.2 *impact, n*—contact caused by a moving object (for example, an impact test missile) striking another object (for

¹ This test method is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.52 on Miscellaneous Playing Surfaces.

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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.

³ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.