



Standard Test Method for Measuring Impact-Attenuation Characteristics of Natural Playing Surface Systems Using a Lightweight Portable Apparatus¹

This standard is issued under the fixed designation F1702; 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 is used to determine the impact-attenuation characteristics of natural turfgrass and soil playing surface systems with a lightweight portable apparatus. This test method can be used to compare the impact attenuation characteristics of natural playing surface systems, as well as assessing the effects of management practices on the impact attenuation characteristics. This test method also can be used to assess the compactibility of natural playing surfaces by recording g -max values or penetration of successive impacts, or both.

1.2 This test method provides a procedure for assessing impact attenuation characteristics in the field, on both actual playing surfaces and research plots. Numerical data will not be comparable to data obtained using a different missile mass or geometry, different drop height, or different standard method, for example, Test Method F1936.

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

1.4 *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

D5874 Test Method for Determination of the Impact Value (IV) of a Soil

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

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

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

F355 Test Method for Impact Attenuation of Playing Surface Systems and Materials

F1936 Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field

F2650 Terminology Relating to Impact Testing of Sports Surfaces and Equipment

F2651 Terminology Relating to Soil and Turfgrass Characteristics of Natural Playing Surfaces

3. Terminology

3.1 *Definitions*—Except as noted, definitions in this standard are in accordance with Terminologies F2650 and F2651.

4. Summary of Test Method

4.1 A 2.25-kg missile is dropped from a specific height, through a guide tube, onto a playing surface. A linear accelerometer mounted on the missile monitors the acceleration and time history of the impact. The maximum acceleration during the impact (relative to gravity) is recorded and reported as g -max. Reporting the time history of the impact is optional. Depth of penetration from successive drops may also be recorded optionally as an indication of soil compactibility.

NOTE 1—This test method is based on an impact tester developed by Clegg (1,2).³ See Test Method D5874. Such impact testers are commercially available. Commercially available Clegg Impact Soil Testers display results in impact value units, where one impact value equals 10 g -max units (Test Method D5874), and typically do not display tenths of an impact value unit. For use in this standard, the display should be altered by the manufacturer or authorized personnel to indicate tenths of an impact value or 1 g -max unit. Also, other suitable recording equipment can be used to obtain resolution to 1 g -max. A 4.5-kg missile has been used to evaluate road base surfaces (1,2). A 0.5-kg poly(vinyl chloride)

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 F08.64 on Natural 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 Numbers in parentheses refer to the list of references at the end of this test method.