



Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment¹

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INTRODUCTION

The need for a systematic means of evaluating surfacing materials for use on playgrounds has been amply demonstrated by the current difficulty in assessing the relative merits of such surfaces amid a diversity of testing methods, agencies, and terminology. Consequently, the goal of this specification is to establish a uniform means for measure to compare characteristics of the materials in order to provide the potential buyer with a useful yardstick by which to measure available materials as a surface under and around playground equipment.

1. Scope

1.1 This specification covers minimum impact attenuation requirements, when tested in accordance with Test Method F 355, for surface systems to be used under and around any piece of playground equipment from which a person may fall. This specification applies to all types of material that can be used under playground equipment.

1.2 This specification does not imply that an injury cannot be incurred if the surface system complies with this specification.

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

1.4 The following precautionary statement pertains to the test method portions only, Sections 12 and 13, of this specification: *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:

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method²

F 355 Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials³

F 429 Test Method for Shock-Attenuation Characteristics of Protective Headgear for Football³

2.2 SAE Standard:

SAE J 211 Recommended Practice for Instrumentation for Impact Tests⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *acceleration*—the time rate of change of velocity.

3.1.2 *around playground equipment*—the area under and surrounding playground equipment established as protection from falls from equipment.

3.1.3 *deceleration*—the time rate of reduction of velocity.

3.1.4 *g*—acceleration into gravity at the earth's surface at sea level (32 ft/s (9.8 m/s)).

3.1.5 *g-max*—the multiple of *g* that represents a maximum deceleration experienced during an initial impact.

3.1.6 *headform*—the striking part of a testing apparatus.

3.1.7 *head injury criteria (HIC)*—a measure of impact severity that considers the duration over which the most critical section of the deceleration pulse persists as well as the peak level of that deceleration.

3.1.8 *impact attenuation*—the ability of a surface system to reduce and dissipate the energy of an impacting body.

3.1.9 *impact velocity*—the velocity of a falling body at the time of impact.

¹ This test method is under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and is the direct responsibility of Subcommittee F08.63 on Playground Surfacing Systems.

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² *Annual Book of ASTM Standards*, Vol 14.02.

³ *Annual Book of ASTM Standards*, Vol 15.07.

⁴ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.