



## Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment<sup>1</sup>

This standard is issued under the fixed designation F1951; 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.

### INTRODUCTION

The need for systematic and consistent means of evaluating the capability of surface systems to provide access to playgrounds has been amplified by the passage of the Federal Americans with Disabilities Act. The goal of this specification is to establish uniform means to measure the characteristics of surface systems in order to provide the potential buyer with performance specifications to select materials for use as an accessible surface under and around playground equipment.

### 1. Scope

1.1 This specification establishes minimum characteristics for those factors that determine accessibility. This specification applies to all types of materials that can be used under and around playground equipment.

1.2 The material under and around playground equipment that meets this specification must also comply with Specification **F1292** if the surface is within the fall zone.

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

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard. (See **IEEE/ASTM SI 10**.)

1.5 The following precautionary statement pertains only to the test method portions, Sections 6 and 7, 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:*<sup>2</sup>

**IEEE/ASTM SI 10** American National Standard for Use of the International System of Units (SI): The Modern Metric System

**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

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

**F1487** Consumer Safety Performance Specification for Playground Equipment for Public Use

2.2 *U.S. Architectural and Transportation Barriers Compliance Board Document:*<sup>3</sup>

**Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities**

2.3 *U.S. Consumer Product Safety Commission Document:*<sup>4</sup>

**US CPSC Publication No. 325 Handbook for Public Playground Safety (2010)**

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee **F08** on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee **F08.63** on Playground Surfacing Systems.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from United States Access Board, 1331 F Street, NW, Suite 1000, Washington, DC 20004-1111, <http://www.access-board.gov/>.

<sup>4</sup> Available from United States Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD, 20814, <http://www.cpsc.gov/>.

### 3. Terminology

#### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *camber, n*—the angular position in the vertical direction of the individual main wheel axis.

##### 3.1.1.1 Discussion—

Zero camber occurs when the wheel axis is parallel to the ground surface.

3.1.2 *loose fill system, n*—a surface system consisting of small independent, movable components.

##### 3.1.2.1 Discussion—

Examples of movable components include sand, gravel, wood chips, loose rubber, and engineered wood fiber.

3.1.3 *maneuverability, n*—the ability of a surfacing material to allow unencumbered traversing or locomotion of a person with or without prosthetic aids or wheelchair.

3.1.4 *toe, n*—the difference in separation distance between the front of the two main wheels and the rear of the two main wheels of a wheelchair.

##### 3.1.4.1 Discussion—

Proper toe alignment occurs when the axle is perpendicular to the direction of rolling.

3.1.5 *use zone, n*—area beneath and immediately adjacent to a play structure or equipment that is designated for unrestricted circulation around the equipment and on whose surface it is predicted that a user would land when falling from or exiting the equipment.

##### 3.1.5.1 Discussion—

The surface area within the use zone shall meet the minimum impact attenuation requirements of Specification **F1292** from the maximum fall height.

### 4. General Requirements

4.1 Playground surfaces represented as complying with this specification shall meet all applicable requirements regarding accessibility specified herein. Anyone representing compliance with this specification shall keep such essential records as are necessary to document any claim that the requirements within this specification have been met.

4.2 Surface systems that are within the use zone of the surrounded playground equipment shall be tested in accordance with Specification **F1292** and shall comply with the impact performance requirements of Specification **F1292**. Thus, surface systems shall exhibit a head injury criterion (HIC) not exceeding 1000 and a value of acceleration recorded during an impact (g-max) not exceeding 200 from a height at or greater than the fall height of the play structure.

NOTE 1—This is consistent with the guidance contained in US CPSC Publication No. 325.

4.3 Accessibility specification certification compliance shall be conducted by an independent accredited testing laboratory.

### 5. Performance Requirement

5.1 The tests shall be conducted on a surface that is installed per the manufacturers' installation instructions. No additional compaction or other modification shall be permitted, other than what is required for test specimen preparation with Specification **F1292**.

5.2 *Maneuverability*—When tested in accordance with the test methods described in Sections 6 and 7 of this specification, a surface in place shall have average work per foot (work per meter) values for straight propulsion and for turning less than the average work per foot (work per meter) values for straight propulsion and for turning, respectively, on a hard, smooth surface with a grade of  $7.1 \pm 0.2\%$  (1:14).

### 6. Wheelchair Work Measurement Method—Straight Propulsion

#### 6.1 Test Equipment and Setup:

6.1.1 *Test Wheelchair*—A 16-in. (40.64-cm) width rehabilitation wheelchair with pneumatic rear tires, front wheels with pneumatic tires, and a total weight of  $31 \pm 4.4$  lb ( $14 \pm 2$  kg) shall be used as the test wheelchair. The rear wheels shall be identical with 24 by 1.375-in. (61 by 3.5-cm) pneumatic tires and pushrim diameters of 20 in. (50.8 cm). The front wheels with pneumatic