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Standard Consumer Safety Specification for Beach Umbrellas and Anchor Devices¹

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INTRODUCTION

This consumer safety specification addresses incidents associated with beach umbrellas that were identified by the U.S. Consumer Product Safety Commission (CPSC). Incidents identified by CPSC and addressed in this standard include lacerations and impalement from the shaft/pole of a windblown airborne beach umbrella. Umbrellas are commonly used as protection against sun, rain, or other potential weather on beaches, in recreation areas, and at resorts. In windy conditions, beach umbrellas have detached from the sand, and the windblown umbrella shaft has impacted various parts of a bystander's body, has caused serious injury and at least two deaths. *It has been established through empirical testing that umbrellas without effective anchoring devices are **NOT** safe for use on beaches.* This specification is written to address currently available beach umbrella/anchor systems and future beach umbrella/anchor system designs. It is intended to be updated if substantive information becomes available that necessitates additional requirements or justifies revision of existing requirements.

1. Scope

1.1 This consumer safety specification establishes performance requirements for beach umbrella/anchor systems to prevent the beach umbrella/anchor system from detaching from the sand, including any entity that provides the use of beach umbrellas.

1.2 No products existing or manufactured after the approval date of this consumer safety specification shall, either by label or other means, indicate compliance with this specification unless they conform to all applicable requirements contained herein.

1.3 Test methods in this specification are to be used for the evaluation of beach umbrella/anchor systems to determine the suitability of the beach umbrella/anchor system in a use environment based on safety in wind conditions.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*²

[D2487 Practice for Classification of Soils for Engineering Purposes \(Unified Soil Classification System\)](#)

2.2 *ANSI Standards:*³

[ANSI Z535.1 Safety Colors](#)

[ANSI Z535.4 Product Safety Signs and Labels](#)

[ANSI Z535.6 Product Safety Information in Product Manuals, Instructions and Other Collateral Materials](#)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *anchor device, n*—a device that is attached to or integrated into the umbrella pole and is secured in or on the sand on a beach, which enables the umbrella to perform in an open upright or angled position and prevents the umbrella from becoming airborne.

3.1.2 *area of the umbrella plane, n*—the number of square feet of the umbrella plane as derived using geometric calculations (see calculation in 7.3).

¹ This consumer safety specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.79 on Market Umbrellas.

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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 American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

3.1.3 *beach umbrella, n*—a removable device installed in or on the sand on a beach, consisting of a canopy supported by a single shaft/pole, used as protection against sun, rain, or other potential weather.

3.1.4 *beach umbrella/anchor system, n*—a beach umbrella combined with an anchor device that is either attached to the pole or integrated with the pole.

3.1.5 *canopy, n*—cloth or other material covering a folding frame.

3.1.6 *secure, adj*—not detached from the sand.

3.1.7 *subangular, adj*—one of the six standard categories used commercially to describe the shape of sand or rock particles; subangular means free from sharp angles, though not smoothly rounded.

3.1.8 *umbrella plane, n*—a two-dimensional shape formed by the lower edges of the umbrella canopy.

3.1.9 *wind tunnel, n*—a facility used to simulate the air flow conditions around either a stationary object or an object moving through air.

4. Calibration and Standardization

4.1 Angle measurements shall be obtained using a digital inclinometer capable of 0.1° minimum resolution.

4.2 Force measurements shall be obtained using a gauge with a minimum accuracy of ± 0.25 lbf.

4.3 Wind tunnels used to evaluate performance may be open or closed circuit, with a test section of sufficient size to

accommodate the anchored beach umbrella sample, capable of flow uniformity of 0.5 % to 2 %, and capable of wind speeds more than 40 mph.

5. General Requirements

5.1 The product must be in an undamaged condition and fully functional for testing.

5.1.1 If repetitive tests are done, the product must remain in an undamaged condition for subsequent tests.

6. Performance Requirements

6.1 *Attachment Strength*—Beach umbrella poles and anchors shall be so constructed that the product(s) remains secure (see 3.1.6) in or on the sand surface when tested per 7.5 or 7.6.

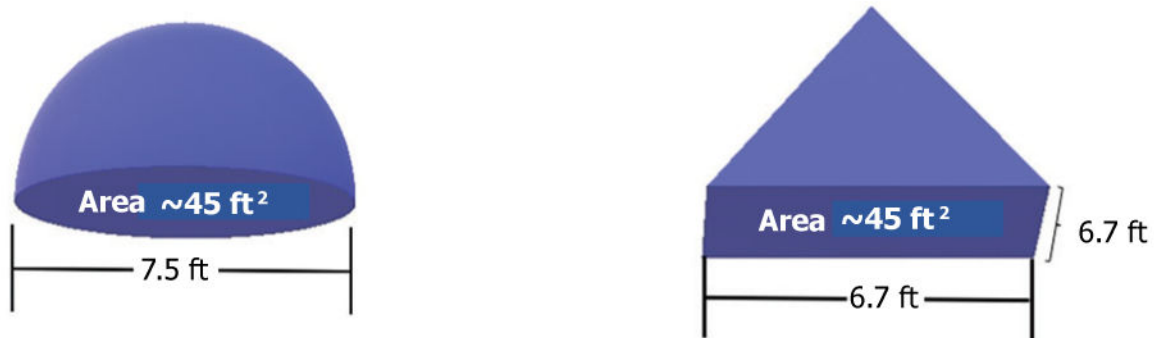
6.2 Beach umbrella/anchor systems with an area of the umbrella plane 45 ft^2 or less may use either test in 7.5 or 7.6.

6.3 Beach umbrella/anchor systems with an area of the umbrella plane over 45 ft^2 must use the test in 7.6.

NOTE 1—The test in 7.5 simulates the upward lift force created by a 30-mph wind on an umbrella canopy with an area of the umbrella plane up to 45 ft^2 .

7. Test Methods

7.1 The umbrella/anchor system shall be tested in a test fixture/sand box having the minimum test area dimensions of 3 ft long by 3 ft wide by 2 ft deep. The box shall be filled with subangular quartz sand (typical of beach sand) consisting of at least 90 % (by weight) sand which is “coarse-grained” as defined in Practice D2487.



Area is calculated based on a two-dimensional plane formed by the lower edges of the umbrella.

- For a dome-shaped or cone-shaped umbrella canopy as shown above on the left, the plane is a circle.
- For an irregularly-shaped umbrella canopy, a suitable geometric calculation of the plane must be done. A simple example is a pyramid, as shown above on the right, where the plane is a rectangle; in this example, a square.

FIG. 1 Test Umbrella Plane Area Calculation