



Designation: F2666 – 16

## Standard Specification for Aboveground Portable Pools for Residential Use<sup>1</sup>

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### INTRODUCTION

This specification has been developed to address the risk of drowning and other hazards associated with portable pools. Portable pools—including “self-rising,” “soft-sided self-rising,” “frame pools,” “big blue pools,” “inflatable,” or “inflatable top ring” pools—reemerged in the market in the 1990s. To date, the Consumer Product Safety Commission (CPSC) has reports of nearly 100 portable pool drowning deaths and submersions from 2000 through 2006. Most of these incidents involve children younger than four years of age. In 2005, there were 32 portable pool drowning deaths and 7 additional submersion incidents reported to the Commission. This is nearly triple the number of drowning and submersion incidents the previous year. Further, it is likely that these numbers are undercounts as the CPSC had not previously distinguished among pool types in its database. This specification has been developed by ASTM International in response to this emerging hazard.

### 1. Scope

1.1 This specification provides safety and performance requirements for portable pools for residential use.

1.2 This specification addresses pool hazards including childhood drowning, sanitation, electrical safety, and entrapment.

1.3 This specification covers both portable pools that are designed to be used with pumps and filters and those not designed to be used with pumps and filters.

1.4 This specification covers all types of portable pools with a water depth of less than 36 in. (91 cm). Aboveground/on ground residential swimming pools with a water depth of 36 in. (91 cm) or greater shall comply with ANSI/APSP-4.

1.5 This specification does not cover public pools, pools used in commercial amusement parks, water fountains, water displays, or fish ponds.

1.6 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.

1.7 *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>

[F963 Consumer Safety Specification for Toy Safety](#)  
[F1346 Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs](#)

#### 2.2 ANSI Standards:<sup>3</sup>

[ASME/ANSI A112.19.8 Suction Fittings for Use in Swimming Pools, Wading Pools, Spas and Hot Tubs](#)  
[ANSI Z535.4 American National Standard for Product Safety Signs and Labels](#)  
[ANSI/APSP-4 American National Standard for Aboveground/On-Ground Residential Swimming Pools](#)  
[ANSI/APSP-7 American National Standard for Suction Entrapment Avoidance in Swimming Pools, Spas, Hot Tubs and Catch Basins](#)  
[ANSI/APSP-16 American National Standard for Standard Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs](#)  
[ANSI/IAF-8 Model Barrier Code for Residential Swimming Pools, Spas, and Hot Tubs](#)

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.60 on Portable Pools.

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

**ANSI Z535.6 Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials**

2.3 *Underwriters Laboratories Standards*:<sup>4</sup>

**UL 943 Ground Fault Circuit Interrupters**

**UL 1081 Standard for Swimming Pool Pumps, Filters, and Chlorinators**

2.4 *CPSC Documents*:<sup>5</sup>

**CPSC Pub. No. 362 Safety Barrier Guidelines for Home Pools**

2.5 *Other Standards*:

**16 CFR 1501 Method for Identifying Toys and Other Articles Intended for Use by Children Under 3 Years of Age Which Present Choking, Aspiration, or Ingestion Hazards Because of Small Parts**<sup>6</sup>

2.6 *ISO/IEC Standard*:<sup>7</sup>

**ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories**

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *compliant, adj*—obeying, produced in accordance with specific rules.

3.1.2 *consistent, adj*—harmonious with or compatible.

3.1.3 *fill line, n*—visible mark on the interior of the pool or as designated by the manufacturer to indicate the recommended maximum water depth.

3.1.4 *nationally recognized testing laboratory, n*—a lab that conducts all testing or certification of products, or both, and is accredited to ISO/IEC 17025 by a member of ILAC (International Laboratory Accreditation Council).

3.1.5 *permanent, adj*—durable to the degree of maintaining safe viewing distance (see 8.3.2), clarity, legibility, and color stability for the reasonably expected life of the product.

3.1.6 *portable pool, n*—any movable structure with the intended purpose of being used for swimming or other water recreation by consumers, and having a water depth (at the fill line) less than 36 in. (91 cm).

3.1.7 *suction outlet, n*—a fitting, fitting assembly, cover/grate and related components that provide a localized low pressure area for the transfer of water from a swimming pool, wading pool, spa, or hot tub.

3.1.8 *water watcher tag, n*—tag worn by the designated adult responsible for watching children in or near the pool.

### 4. Classification

4.1 *Types*:

4.1.1 *Type A—Portable Pools without a Pump and Filter*—Pools with no means of water circulation or water treatment during or after use. Such pools include but are not limited to wading pools, splash pools, and kiddy pools.

4.1.2 *Type B—Portable Pools with Pumps and Filters*—Pools that are provided with a means or connection provisions to add equipment for circulation and filtration of water.

### 5. Performance Requirements

5.1 *Ladders*—Any ladders sold with or for use with Type A or Type B pools shall meet all the applicable requirements found in ANSI/APSP-4 and be child resistant to the degree of preventing unauthorized access for children under the age of five years. Verification can be satisfied by document review.

5.2 *Structural Integrity*:

5.2.1 *Resistance to Horizontal Force*—To prevent injuries associated with sudden release of water, pools with a fill line at 18 in. (46 cm) or greater shall not break or collapse such that the pool loses its structural integrity or functionality when tested in accordance with 6.1.1. For pools with flexible side walls shaped by the water content, this testing may result in temporary lowering of the pool sides as a result of water loss through spillage. This is considered a failure if the overall structural integrity and functionality are not maintained and water continues to flow after the test.

5.2.2 *Resistance to Vertical Force*—To prevent injuries associated with sudden release of water, pools with a fill line at 18 in. (46 cm) or greater shall not break or collapse such that the pool loses its structural integrity or functionality when tested in accordance with 6.1.2. For pools with flexible side walls shaped by the water content, this testing may result in temporary lowering of the pool sides as a result of water loss through spillage. This is considered a failure if the overall structural integrity and functionality are not maintained and water continues to flow after the test.

5.3 *Air Valves for Inflatable Pool Sections*:

5.3.1 All air valves shall be accessible for each inflatable section. Once a section of the pool is inflated, the air valve shall be capable of being inserted inside the inflated section without extending beyond the surface more than 0.2 in. (5 mm).

5.4 *Small Parts, Sharp Edges*—No small parts, as defined by 16 CFR 1501, shall be readily accessible. There shall be no accessible, potentially hazardous sharp edges or corners, as defined by Consumer Safety Specification F963.

5.5 *Pool Covers*—If a pool “safety” cover is included or made available as an optional accessory, the cover shall comply with Performance Specification F1346. If the cover is not claimed to be a safety cover, it shall bear a label as indicated in 8.3.6.

5.6 *Suction Outlets*—Submerged suction outlets shall comply with the requirements of ANSI/APSP-7 and be tested by a Nationally Recognized Testing Laboratory in accordance with ANSI/APSP-16.

5.7 *Water Watcher Tags*—Water watcher tag shall not deteriorate or lose legibility when tested in accordance with 6.2.

5.8 *Type B—Portable Pools with Pumps and Filters*:

<sup>4</sup> Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, <http://www.ul.com>.

<sup>5</sup> Available from U.S. Consumer Product Safety Commission (CPSC), 4330 East West Hwy., Bethesda, MD 20814, <http://www.cpsc.gov>.

<sup>6</sup> Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

<sup>7</sup> Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

5.8.1 Manufacturers of Type B pools shall provide at the minimum necessary filtration equipment to keep the pool clean. Pumps and filters shall be designed to turn over the total volume of pool water no less than once every 12 h.

5.8.2 All suction outlets included or sold for use with Type B pools shall be tested by a Nationally Recognized Testing Laboratory and certified to conform to ASME/ANSI A112.19.8 or its successor standard ANSI/APSP-16, in order to prevent suction entrapment.

5.9 Pumps provided for the circulation of water with Type B pools shall be tested by a Nationally Recognized Testing Laboratory and certified to conform to UL1081.

**6. Tests**

6.1 All tests conducted under Section 6.1 shall be tested with the pool fully inflated and filled to the manufacturer’s recommended fill line.

6.1.1 *Resistance to Horizontal Force*—Place a two-sided corner block with the dimensions 15¾ by 4 in. (400 by 100 mm) on the top edge of the pool’s most vulnerable point (see Fig. 1). Apply a horizontal force of 90 lbf (400 N) to the vertical center of the block for a period of 10 s.

NOTE 1—This is based on the weight of the average 5.5- to 6.5-year-old child (combined genders), which is 45 lb (20.5 kg). Two children of this age or younger impulsively leaning or sitting together on a pool’s side is a foreseeable use.

6.1.2 *Resistance to Vertical Force*—Place a two-sided corner block with the dimensions 15¾ by 4 in. (400 by 100 mm) on the top edge of the pool’s most vulnerable point. Apply a vertical force of 90 lbf (400 N) to the horizontal center of the block for a period of 10 s.

6.2 *Water Resistance of Water Watcher Tags*—Submerge water watcher tag in water for a duration of one hour. Remove tag from water, dry and, evaluate material deterioration and loss of legibility.

**7. Instructions**

7.1 *General*—Instructions for all pools subject to this specification.

7.1.1 Written instructions shall be provided with each pool. Instructions may be accompanied by illustrations that the manufacturer determines are necessary, appropriate, or may facilitate proper assembly, use, maintenance, and storage, or a combination thereof.

7.1.2 Instructions shall contain the following (or equivalent) header: “Read and Follow All Safety Information and Instructions. Keep for Future Reference. Failure to follow these warnings and instructions can result in serious injury or death to users, especially children.” The font of the header shall be larger and bolder compared to the body of the text. This information shall be in a prominent place.

7.1.3 Instructions shall include the pool model name or number, the name, address, and phone number of the manufacturer, distributor, or retailer and shall cover, at a minimum: pool safety, product description, parts, filling (including information on the fill line), emptying, deflation (if applicable), cleaning, maintenance, and storage.

7.1.4 Instructions shall include one removable water watcher tag, along with instructions as to proper use and information regarding sources for replacement tags. The following or similar information should be stated:

7.1.4.1 Assign an adult to be responsible for watching children in the pool. Give this person a “water watcher” tag and

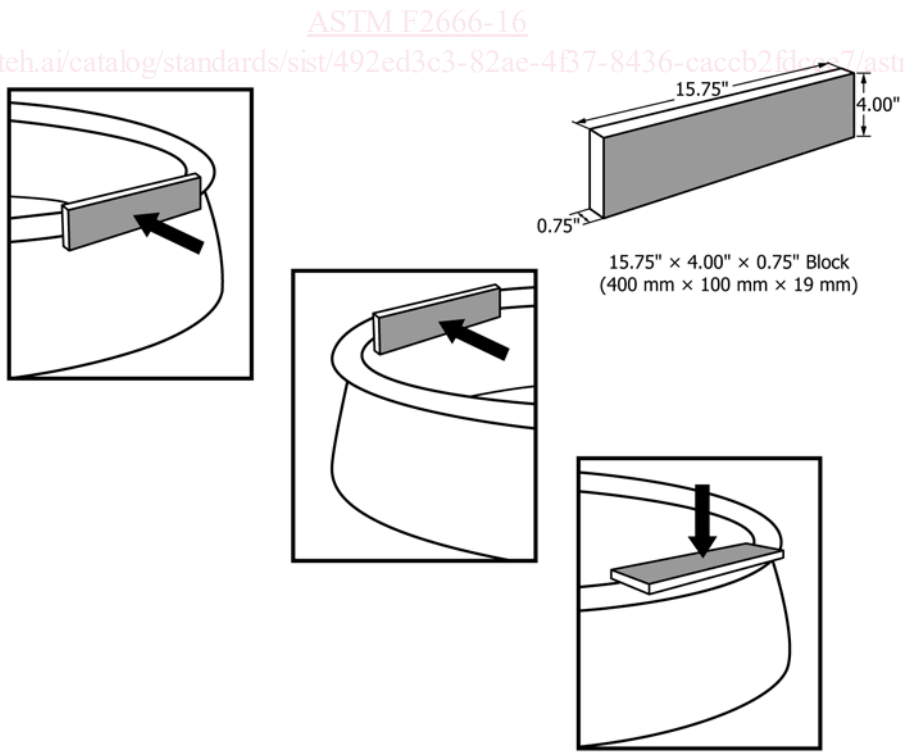


FIG. 1 Resistance of Horizontal and Vertical Force

ask that they wear it the entire time they are in charge of supervising children in the pool. If they need to leave for any reason, ask this person to pass the “water watcher” tag and the supervision responsibility to another adult.

7.1.4.2 An example of such waterwatcher tag can be found in Fig. X1.5.

7.1.5 The instructions for pools with a depth greater than 18 in. (46 cm) shall direct consumers to barrier recommendations as described in CPSC Pub. No. 362 found at [www.poolsafely.gov](http://www.poolsafely.gov).

7.1.6 The instructions shall make recommendations regarding placement of the pool and shall state that portable pools shall be set up so that they comply with local safety and building codes.

## 7.2 Safety Information Included in Printed Instructions for All Pools Subject to This Specification:

7.2.1 Safety information and warnings shall be presented at the front of the instruction booklet. The first item mentioned under pool safety shall be an ANSI Z535.4-consistent warning pertaining to the drowning hazard. This warning shall include the following: (1) a safety alert symbol in the signal word panel; (2) a pictorial panel; and (3) a message panel that clearly states the hazard and how to avoid it.

(1) The pictorial shall represent direct supervision of young children.

(2) For Type A pools, the text of the message panel shall state these or equivalent words:

Children under 5 are at highest risk for drowning.

Closely watch children who are in or near this pool.

Empty pool or prevent access when not in use.

(3) For Type B pools, the text of the message panel shall state these or equivalent words:

Children under 5 are at highest risk for drowning.

Closely watch children who are in or near this pool.

(4) An example of such a warning can be found in Fig. X1.1 (Drowning Label for Type A Pools) and Fig. X1.2 (Drowning Label for Type B Pools).

(5) Alternative ANSI-consistent warning designs are acceptable as long as they are conspicuous and legible, and include: (1) a safety alert symbol in the signal word panel; (2) a pictorial panel; and (3) a message panel that clearly states the hazard and how to avoid it.

(6) The warning shall be offset from other text through the use of a border and may be rendered in the Pantone equivalent safety color. For instruction manuals that are printed exclusively in black and white or are monochromatic, the warning may be printed in black and white.

7.2.1.1 In addition to the drowning warning label, the instruction manual shall list the following drowning-related safety information (or equivalent), where applicable:

*Prevent Young Children From Drowning:*

Install fencing or approved barrier around all sides of pool.

State or local laws or codes may require fencing or other approved barriers. Check state or local laws and codes before setting up pool.

Drowning occurs silently and quickly. Assign an adult to supervise pool and wear provided water watcher tag.

Keep children in your direct sight when they are in or near pool and when you are filling and emptying pool.

When searching for a missing child, check pool first, even if you think your child is in the house.

### *Prevent Young Children From Gaining Access to Pool:*

Remove pool ladders before leaving pool. Toddlers can climb ladder and get into pool.

Position furniture away from pool so that children cannot climb and gain access to pool.

When leaving pool, remove floats and toys from pool that might attract a child.

### *Be Prepared to Respond to an Emergency:*

Keep a working phone and list of emergency numbers near pool.

Become certified in cardiopulmonary resuscitation (CPR) so you can respond to an emergency.

7.2.1.2 The instruction manual for pools that are not intended to be emptied instantaneously by flipping over or deflating their sidewalls for immediate dumping of water shall also include the following statement: *Pool presents a drowning hazard even during filling and draining of the pool. Maintain constant supervision of children and do not remove any safety barriers until the pool is completely empty and stowed away.*

## 7.3 Safety Information Included in Printed Instructions for Pools with a Water Depth above 12 in. (30 cm):

7.3.1 Instructions for pools with a water depth above 12 in. (30 cm) shall bear an ANSI Z535.4-consistent warning against diving into shallow water. The warning shall include the following: (1) a safety alert symbol in the signal word panel; (2) a pictorial panel, and (3) a message panel. The text of the message panel shall state these words or equivalent words. The pictorial shall represent a dive into shallow water with the prohibition sign. The text of the message panel shall state these or equivalent words:

(1) “No Diving. You can break your neck and be paralyzed.”

(2) An example of such a warning can be found in Fig. X1.3. Alternative ANSI-consistent warning designs are acceptable as long as they are conspicuous and legible, and include: (1) a safety alert symbol in the signal word panel; (2) a pictorial panel, and (3) a message panel that clearly states the hazard and how to avoid it.

(3) The warning shall be offset from other text through the use of a border and may be rendered in the Pantone equivalent safety color. For instruction manuals that are printed exclusively in black and white or are monochromatic, the warning may be printed in black and white.

## 7.4 Safety Information Included in Printed Instructions for Pools with Electrical Components:

7.4.1 An ANSI Z535.4-consistent warning about electrocution risks shall be placed at the beginning on instructions pertaining to pool setup. The warning shall include the following: (1) a safety alert symbol in the signal word panel, and (2) a message panel. An optional pictorial panel may also be used to illustrate the hazard or how to avoid it. The text of the message panel shall state these words or equivalent words.