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StandardGuide for Use of a Residential Swimming Pool, Spa, and Hot Tub Safety Audit to Prevent Unintentional Drowning¹

This standard is issued under the fixed designation F2518; 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

This guide has been developed because at least 240 children under 5 years old drown in pools each year nationwide and an additional 1800 are treated in hospital emergency rooms for pool submersion injuries. Most of the cases involve residential pools.

This guide is intended to be of use to a number of individuals and associations in evaluating specific levels of pool safety. The intended users include: pool professionals, code officials, regulatory officials, insurance agencies, home owners, and so forth. The principles outlined are expected to be used by other groups and associations and published in other forms that could be more readily available.

In 1994, the U.S. Consumer Product Safety Commission (CPSC) issued safety barrier guidelines for home pools, hot tubs, and nonportable spas. To address the risk of drowning, CPSC recommends the use of barriers and other safety devices to create “layers of protection.” Barriers that restrict the access of young children to the pool include fences or walls that are at least 4 ft (1 m) high and completely surround the pool, self-closing/self-latching gates, door alarms, and power safety covers. Other devices, such as gate and pool alarms, provide additional protection by warning that an unsupervised child has entered the pool area or the pool itself.

It is essential that adults actively supervise children around the pool, spa, or hot tub at all times. Adults must never leave a child unsupervised around the water even for a second. It is recommended to have a life ring, shepherd’s hook, and portable telephone handy in case of an emergency. Adults who will be supervising children should learn cardiopulmonary resuscitation (CPR).

This guide is based upon the CPSC recommendations for barriers and other safety devices and includes the latest revisions in standards and technology.

1. Scope

1.1 This guide provides a safety audit system for the evaluation of residential pools, spas, and hot tubs based on a layers-of-protection approach to reduce the incidence of drowning involving young children.

1.2 This guide addresses the hazard of unintentional or unsupervised entry of young children into the water of pools, spas, and hot tubs.

1.3 This guide does not address all of the hazards present when a swimming pool, spa, or hot tub is considered not operational, that is, no intent of being used for an extended period of time for reasons such as closed for the season.

1.4 The values given in inch-pound units are to be considered the standard. The values given in parentheses are for information only.

1.5 *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

F1346 Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs

¹ This guide is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.49 on Pool Safety Standards.

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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.

F1908 Guide for Fences for Residential Outdoor Swimming Pools, Hot Tubs, and Spas

F2090 Specification for Window Fall Prevention Devices With Emergency Escape (Egress) Release Mechanisms

F2208 Safety Specification for Residential Pool Alarms

F2286 Design and Performance Specification for Removable Mesh Fencing for Swimming Pools, Hot Tubs, and Spas

2.2 CPSC Guideline:³

Publication No. 362 Safety Barrier Guidelines for Home Pools

2.3 ANSI Standard:⁴

ANSI/NSPI-8 Model Barrier Code for Residential Swimming Pools, Spas, and Hot Tubs

2.4 UL Standard:⁵

UL 2017 Standard for Safety General-Purpose Signaling Devices and Systems—Section 77 Tests—Residential Water-Hazard Entrance Alarm Equipment

3. Terminology

3.1 *Definitions*—See the standards in Section 2 for specific terminology.

4. Residential Pool, Spa, and Hot Tub Safety Audit Using a Menu System with Points Assigned to Various Layers of Protection

4.1 *Explanation*—Child drownings often involve a lapse in supervision, so it is extremely important to ensure that pool owners install multiple layers of protection to prevent, delay, or warn if a child attempts to enter or has entered the pool, spa, or hot tub. Some safety features or systems are more effective than others, so pool owners may have to use and maintain several different types to safeguard against unintentional submersion. Each system listed in the menu is given points for its level of potential effectiveness. The points given to each system are based on the protection gained by using each system. The goal for a safer pool, spa, or hot tub is to accumulate at least SEVEN POINTS in the audit. Each system in itself should provide some level of protection but may not be in use at all times or may not fully address all aspects of the hazard scenario, so a combination of two or more systems may be necessary to reach the minimum goal of SEVEN POINTS. It is possible to go over SEVEN POINTS and it is recommended that layers of protection be installed to exceed SEVEN POINTS to provide an even greater level of protection in and around the pool, spa, or hot tub.

NOTE 1—**IMPORTANT**—Multiple use of any device listed in this menu does not increase the points earned. For example, if a home owner uses more than one door alarm, the points accumulated are still just two points. The same applies for all other devices in this menu. The points accumulated in 5.1-5.5.1 where it is required to use a device or devices from other sections of the menu are included in the five points given in 5.1-5.5.1. For example, where a door alarm is required such as in 5.2, it

does not increase the points earned in that section because it is already required. The points earned remain five points and the same applies for all other devices in this menu.

5. Requirements: Menu of Safety Products for Layers of Protection and Points Earned

5.1 *Permanent Fences/Walls*—Many regional/local building codes specify a properly designed and maintained fence as a primary barrier to reduce or eliminate unexpected entry into the pool, spa, or hot tub. If a building or a dwelling is used as replacement for any part of the fence, skip to 5.2. When a fence or wall completely surrounds a pool, spa, or hot tub, the top of a fence or wall used as a barrier shall be a minimum of 48 in. (122 cm) above grade measured on the side of the wall/fence that faces away from the swimming pool, spa, or hot tub. The maximum vertical clearance between grade and the bottom of the wall/fence shall be 4 in. (10 cm) from a solid surface, such as cement/asphalt. The maximum vertical clearance between grade and the bottom of the wall/fence shall be 2 in. (5 cm) from surfaces that are not solid, such as grass or gravel. The distance between slats, positions of X-members, and other factors are to be designed to prevent children's ability to climb. Decorative details shall not provide the ability to climb. Access gates in the fence or wall shall be self-closing, self-latching, and must have a locking device. Gates shall open outward from the pool, spa, or hot tub. There shall be a clear zone of at least 48 in. (122 cm) between the swimming pool, spa, or hot tub barrier and any permanent structures or pool equipment such as pumps, filters, heaters, and so forth that can be used as an aid to climb the barrier. Fencing shall have at least a 65 % open area to allow visibility from the outside to inside of the pool area. Reference ANSI/NSPI-8, Guide F1908, and CPSC Publication No. 362 for further information.

POINTS EARNED – 5 POINTS ()

5.2 *Where a Building or a Dwelling Is Used as a Replacement for Part of the Fence*—If one or more of the walls of a building or dwelling are used as a barrier and any doors or windows in those walls give access to the pool, spa, or hot tub, then these doors and windows shall have some type of safeguard. When the building or dwelling is any part of the barrier around the pool, spa, or hot tub, door alarms or self-closing, self-latching devices out of reach of children shall be in use on each door. These devices shall meet the requirements of 5.10 or 5.12. Each window shall have a window guard or be fixed in such a way to prohibit a 4-in. (10-cm) sphere to pass through. These windows shall meet the requirements of 5.11. Fences or walls used as the remainder of the barrier shall meet the applicable requirements of 5.1. Reference Guide F1908, ANSI/NSPI-8, UL 2017, Specification F2090, and CPSC Publication No. 362 for details.

POINTS EARNED – 5 POINTS ()

5.3 *Screen Enclosures* that completely surround a swimming pool, spa, or hot tub can be used instead of a fence. If a building or a dwelling is used as replacement for any part of the screen enclosure, skip to 5.4. All doors leading into the enclosure shall have a locking device at least 54 in. (137 cm) from the bottom of the door. Doors shall be self-closing and self-latching with the latching device 54 in. (137 cm) from the bottom of the door. Reference ANSI/NSPI-8, Guide F1908, and CPSC Publication No. 362 for details.

³ Available from U.S. Consumer Product Safety Commission (CPSC), 4330 East-West Hwy., Bethesda, MD 20814, Web: www.cpsc.gov.

⁴ Available from National Spa & Pool Institute (NSPI), 2111 Eisenhower Ave., Alexandria, VA 22314-4698, Web: www.nspi.org

⁵ Available from Underwriters Laboratories (UL), Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062, Web: www.ul.com.