

# Need to Know: Pool and Spa Drain Safety

Insureds such as health/athletic facilities, country clubs, schools, hotels and apartment complexes feature swimming/wading pools and spas. Improperly designed or missing pool/spa drain covers have been associated with severe injuries and fatalities. From 1978–1996, the Consumer Product Safety Commission (CPSC) reported 49 incidents, which included 18 that involved children between the ages of 2–14. Five of the 18 incidents ended in deaths due to body entrapment. Another 13 deaths were attributed to hair entanglement. Until now, there has been no specific legal requirement to control these hazards, although voluntary CPSC standards were in place. In 2007 Congress passed the Virginia Graeme Baker Pool and Spa Safety Act making these voluntary standards mandatory and requiring the Consumer Product Safety Commission to develop a mandatory standard. The law applies to existing and new public pools and spas and must have been implemented by 12/19/2008. The law is named after former Secretary of State James Baker's granddaughter who drowned after her hair became entangled in a damaged drain inlet of a hot tub.

## Four Types of Suction Entrapment

1. **Body entrapment** occurs when suction from a spa/ pool pump pulls a person against a drain cover, completely sealing off the drain cover. As the vacuum pressure builds from the blocked drain, the person cannot escape. As little as fifteen pounds of suction pressure can entrap a small child. Pool pumps can create as much as 500 lbs of pressure at a suction inlet making rescue almost impossible. Often times the pool pump must be turned off to release the trapped swimmer.
2. **Limb entrapment** occurs when a person gets a limb stuck by the suction force of a main drain cover that is incorrectly designed, broken, missing, unsecured, or by a side suction inlet that is not properly covered.
3. **Hair entrapment** occurs when a swimmer's hair is pulled by suction through the main drain grate and the hair swirls and knots, trapping a swimmer underwater.
4. **Evisceration or disembowelment** occurs when an organ is drawn by suction from the body. This can occur when a person (often a small child) blocks the inlet by sitting on an incorrectly designed, missing, broken or unsecured drain cover. As a result of this blockage, the intense suction pressure created results in severe intestinal damage.

## Consumer Product Safety Commission Anti-Entrapment Requirements

Pool owners will need to confirm drain covers/grates, and the circulation system, will meet the new CPSC requirements described below. This should be done by an authorized, trained and properly insured pool maintenance contractor. State or local codes may require additional protective measures or permits and should be checked. Appendix A is a checklist developed by the CPSC for guidance in this area.

### Drain Covers/Grates

1. Must meet the requirements of ASME/ANSI A112.19.8/NSF 50 for antientanglement. Currently used "anti-vortex" designs will not meet this standard unless they measure 24 inches diagonally and allow a flow rate of 1.5 ft/sec. maximum. Each cover design must have a marked maximum flow rate that is not to be exceeded.
2. Require multiple, anti-tamper screws.

### Circulation System

In addition to the drain cover requirements above, a pool or spa with a drain must have one or more of the following:

1. **Safety Vacuum Release System**—automatically shuts off the pump or reverses the flow when a blockage is detected. Must meet ASME/ANSI 112.19.17.

2. **Suction Limiting Vent System**—A relief valve design that opens to atmospheric pressure when a drain is blocked.
3. **Gravity Drainage System**—Circulates pool water via a channel around the pool's perimeter and/or a collector tank vented to the atmosphere.
4. **Automatic Pump Shutoff.**
5. **Any design that provides equal or better protection** than items 1–4 as determined by the CPSC.

### References

Public Law Number 110-140, Title XIV (The Virginia Graeme Baker Pool and Spa Safety Act). The law as well as the Commission's Guidance document (currently in draft form) is available at <http://www.poolsafety.gov/pssa1404pubcom.html>

Guidelines for Entrapment Hazards: Making Pools and Spas Safer, CPSC, 2005 (Voluntary Guidelines)

<http://www.drainsafe.com> has a compilation of news stories on the subject plus technical articles on various pool drain designs.

ASME/ANSI A112.19.8 American National Standards Institute Standard For Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Appliances



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