



ToThePOINT Pool Drains

Mitigating a Hidden Hazard

According to the Consumer Products Safety Commission (CPSC), there have been 130 reported incidents including 27 deaths, mostly children, resulting from entrapment by a swimming pool drain since 1990. Even if the entrapped person is noticed quickly, the rescuers may be unable to physically overpower the suction of the drain before the injury or death takes place.

Swimming pools and spas require filtration of the water to maintain sanitary conditions. Whether this is accomplished by a direct system where the pump is piped directly to a pool drain or indirectly by means of an open sump in a gravity drainage system, the process relies on the creation of a vacuum to convey water to the pump.

Depending on the design of the system, pressures of up to 300 pounds per square inch can be created at the drain. These forces are sufficient to hold bodies against the drain, draw arms or other body parts into the drain, or disembowel victims who sit on the drain. Defective or missing drain or inlet covers can result in body parts, hair, or the victim's swimsuit becoming trapped.

New Legislation Enacted

The CPSC enacted legislation that imposes strict requirements for the design, installation, and maintenance of drain covers on swimming pools, spas, hot tubs, wading pools, fountains, and lazy rivers. The legislation entitled Virginia Graeme Baker Pool and Spa Safety Act applies to all submerged covers on piping that may produce a vacuum for all public pools and spas. The act defines 'public' as any facility open to the public whether free or for a fee, multiple family residential facilities, hotels, and facilities operated by or for the federal government. The act sets the requirements for the minimum level of safe design and performance.

The greatest risk is posed by pools equipped with a single outlet or drain. Pools or spas with a single outlet must have an unblockable outlet or employ at least one of the following controls:

- Safety vacuum release systems (SVRS) that comply with the standard
- Suction-limiting venting
- Gravity drainage system
- Automatic pump shutoff
- Drain disablement



Other protective systems are allowed, but they must be "equally effective as or better than" the systems noted above, according to the act. Pools with multiple main drain points are not exempt from compliance, and drains spaced less than 3 feet apart require additional entrapment prevention measures.

Additional Considerations

- Compliant drain covers are clearly marked with a logo in the shape of a swimmer and the markings: ASME A112.19.8 and the year. Covers may also be marked with lettering only that must include the manufacturer, ASME A112.19.8 2007, plus the flow rating in gpm and the life in years.

- Covers must have rated flow and water velocity that match the design of the pool. If the flow velocity of the cover is exceeded, its ability to prevent injury may be reduced. The most restrictive state standards limit the velocity of water flow to 1.5 feet per second. Each drain cover must be rated for the maximum flow of the pool system as lines in multiple drain systems can become blocked.
- Covers must be approved for their installed position, horizontal or vertical.
- Facility owners and operators should maintain documentation on site that verifies that the outlet covers are compliant and match the design parameters for the filtration system. Documentation may include Certificates of Compliance or other design and engineering data. This is required because covers must match the pool system's capacity, and this cannot be



verified by visual inspection alone. State regulations may impose additional design and documentation requirements.

- All covers must remain securely attached when in use and should be affixed with tamper-resistant devices.
- The condition of submerged suction covers and other covers must be inspected on a daily basis. These inspections should be documented along with any corrective actions to repair or replace defective components. If covers are missing, loose, cracked, or broken, the pool should be closed until repairs are made.

The proper installation and maintenance of suction outlet covers is one element of a comprehensive risk reduction program for pools and spas. Other controls typically include barriers to entry, entry detection, pool alarms, adult supervision of children, proper safety equipment, and warning signs.

Resources

ASME A112.19.8 2007 Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs

Virginia Graeme Baker Pool and Spa Safety Act
www.cpsc.gov/pssa.pdf

CPSC Virginia Graeme Baker Pool and Spa Safety Act Resources
www.cpsc.gov/businfo/vgb/poolspa.aspx

CPSC Pool and Spa Safety Publications
www.cpsc.gov/cpsc/pub/pubs/chdrown.html

Washington State Department of Health Water Recreation and Rules Guidelines
www.doh.wa.gov/ehp/wr/rules.htm

The Association of Pool and Spa Professionals
www.theAPSP.org

Safe Kids
www.usa.safekids.org/water/pool.html

