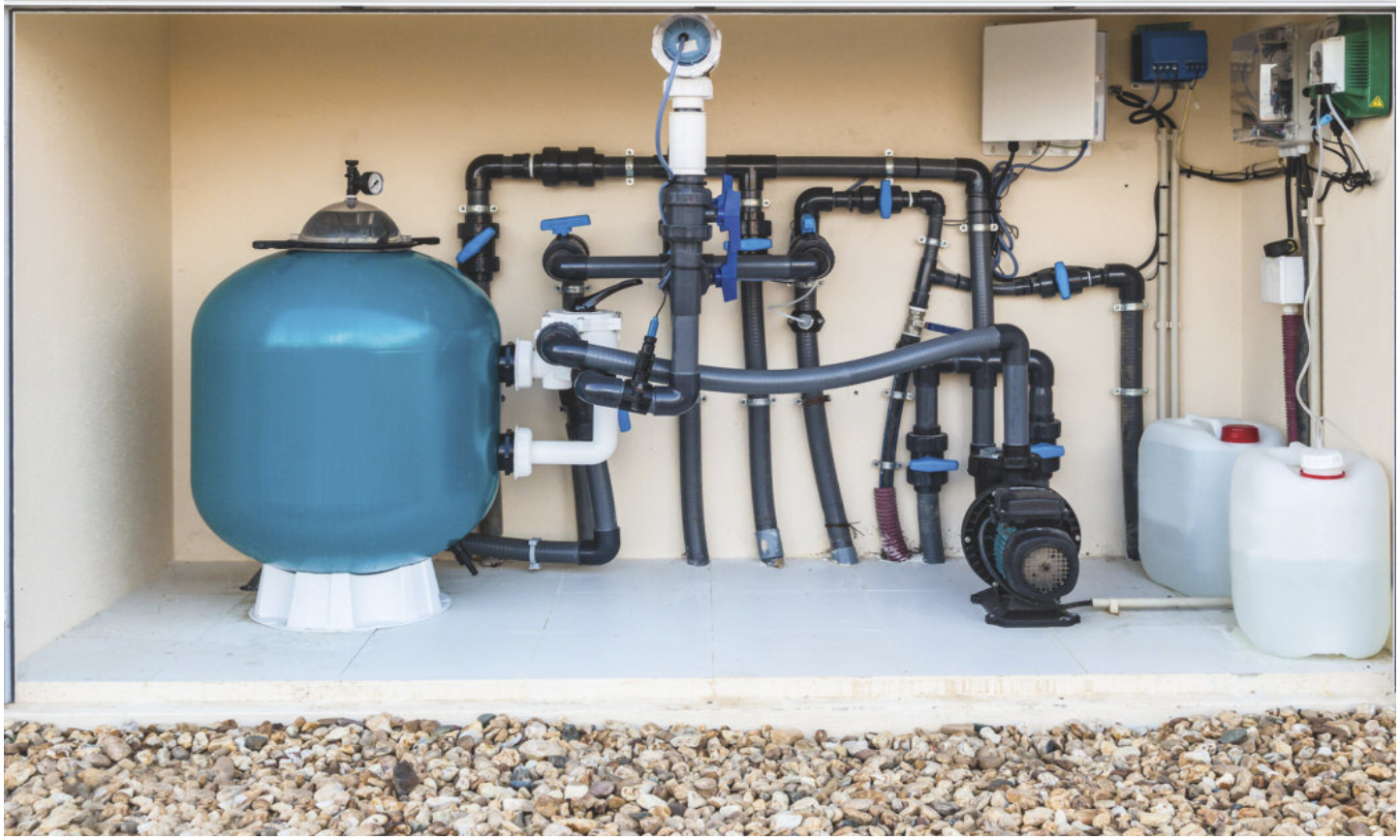

The bomb in your backyard

Exploding pool filters

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As we say goodbye to this winter of getting pummeled by atmospheric rivers of precipitation, many are ready to head into spring and summer pool parties. But there is a danger in the backyard of many ordinary homeowners that you may not be aware of: the exploding pool filter.

Most filters are comprised of a tank, a lid, and a clamp that holds the system together (Figure 1). The filter operates under high pressure generated by a mixture of water and air. The lid can explode off the tank with tremendous force if too much pressure builds up and the clamp fails.

Because of the extremely high pressure that can build in the filter and result in an explosion, a failure can be catastrophic. We have seen cases in which the filter lid has damaged awnings and roofs, become lodged in trees, and damaged ceilings of pool sheds. When the lid of the pool filter hits a person, we have seen

Figure 1

severe traumatic brain injuries, deaths, traumatic loss of eyes, and multiple broken facial bones.

Swimming pool filters present an explosion risk

A swimming pool filter cleans water of debris. Generally, a filter comprises a two-piece tank – a bottom and a top – molded from heavy-duty plastic. The tank bottom holds a filter cartridge that cleans water as it passes through the system. A pump delivers water from the pool to the filter and back to the pool (Figure 2).

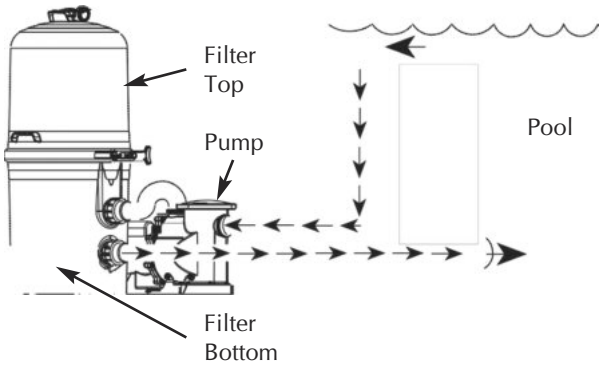

Figure 2

A filter tank can trap or accumulate air. The pump discharge compresses any entrapped air and pressurizes the filter. This creates a risk of explosion or "sudden separation" of filter parts. Filter manufacturers have known about the explosion risk since at least the early 1970's. In 1974, the United States Consumer Products Safety Commission ("CPSC") published an article which reported "problems of exploding filter tanks" (Figure 3).

NEWS from CPSC

U.S. Consumer Product Safety Commission

Office of Information and Public Affairs **Washington, DC 20207**

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The Commission also is considering a variety of approaches that could reduce injuries associated with other pool hazards such as sharp edges and protruding bolts, slippery ladders, decks and diving boards, lack of depth indicators, shock hazards from electrical wiring and problems of exploding filter tanks.

Commission staff recommend a number of precautionary measures consumers can take to reduce home pool hazards.

"...problems of exploding filter tanks."

Construction and maintenance:

- Check local ordinances and codes for safety requirements.
- Use non-slip materials on the pool deck, diving board and ladders.
- The steps of the pool ladder should be at least three inches wide, and the ladder should have handrails on

Figure 3

Consumer Product Safety Division data shows dozens of explosions like the one that disfigured our clients. The manufacturers are well aware of this problem:

1982: filter lid "blew apart" and flew 30 feet;
1983: filter had "pressure induced" explosion;
1983: filter lid "shot up" 10 feet;
1985: filter "blew off" in man's face;
1985: filter lid exploded in pool technician's face;
1985: filter lid exploded in man's face;
1986: filter lid exploded in victim's face;
1986: "Operator reassembles filter…observes a pressure build-up, reaches over the filter…and the filter explodes….";
1989: filter lid blew off and fractured victim's skull;
1990: filter blew into man's head; man semi-comatose;
1991: filter lid blew into woman's head, killing her;
1993: filter lid blew into man's head;
1994: filter exploded, causing blindness and brain damage;
1998: filter lid blew off, flew seven feet and hit man's face.
1998: lid blew off into man's face, knocking him out;
2005: filter exploded in father's face, causing brain damage;
2006: filter lid blew up into homeowner's face, killing him;
2006: filter lid blew into 37-year-old mother, who lost eye;
2006: boy saw filter blow up in face of dad, who died.

Cal-OSHA has researched the prevalence of pool-filter explosions. This research revealed that exploding filters injure consumers and workers alike.

Inexpensive fixes are ignored

A manufacturer can easily equip a filter system with different types of fasteners to hold the top and bottom together. Some fasteners – such as lugs-and-nuts – secure lids better than others. They ensure the lid will not blow off under pressure.

An inferior fastener such as a clamp (Figure 1 on page 37) can bend, break or degrade, and allow the filter lid to blow off with tremendous force. For example, in 2004, the CPSC recalled 8,500 pool filters because the filters' fastener "can disengage from the lower tank shell allowing the top shell of the filter to blow off causing injury to nearby consumers."

Pool filter manufacturers knew or should have known about the explosion risks before designing almost every pool filter that remains in use today. In 2001, a pool filter manufacturer known as B & S Plastics, Inc. (dba Waterway) recalled 19,500 filter systems after it received at least three sudden-separation claims. Waterway said, "There have been several reported instances in which the top half of the filter housing has suddenly, and without warning, been blown off the lower housing with great force." Waterway admitted, "These filters operate under a typical pressure of 15-25 psi. If the top half of the housing separates under pressure there is the potential for serious personal injury."

Nevertheless, dangerous pool filters continue to be manufactured and sold today without the protections that are readily available.

Products liability theories of liability

A product with a design defect or inadequate instructions subjects the manufacturer to strict liability. (See, *Wright v. Stang Manufacturing Co.* (1997) 54 Cal.App.4th 1218, 1228-1229.) A product has a design defect if the product's inherent risks outweigh its benefits. (*Gonzalez v. Autoliv* (2nd Dist., 2007) 64 Cal.Rptr 3d 908, 913.) The risk-benefit test includes weighing such factors as (a) the gravity of the danger posed by the challenged design, (b) the likelihood such danger would occur, (c) the mechanical feasibility of a safer alternative design, (d) the financial cost of an improved design, and (e) the adverse consequences to the product and to the consumer that would result from an alternative design. (*Ibid*.)

Other-accident evidence can establish that a product presented an unreasonable risk of harm; and the manufacturer knew or should have known about the product's risks. (*Benson v. Honda Motor Co.* (1994) 26 Cal.App.4th 1337, 1344-1345.) Once the plaintiff shows the product's design caused the injury, the defendant bears the burden to prove the absence of a defect. (*Id*. at 914; *Bernal v. Richard Wolf Medical Instruments Corp.* (1990) 221 Cal.App.3d 1326, 1332.)

Pool filters with weak clamp assemblies are defective in design because they pose a significant, foreseeable danger that a safer, feasible and practical alternative design would have eliminated.

• *The gravity and likelihood of explosion*

The potential for a clamp failure and filter-lid explosions pose a grave danger to consumers. Explosions are predictable, given the history of explosion problems.

The CPSC recognized this risk in the 1970's. Manufacturers understood this risk when one of their peers recalled over 19,000 filters in the early 2000's, and called the sudden-separation risk "a matter of public safety." The recalled filter involved a tank with a top and bottom held together by a "locknut" or giant screw, as opposed to a multiple-lug nut system. That manufacturer recalled the filter because users reported explosions, including one that injured an eye.

Finally, NSF/ASNI standard 50 requires an automatic air-relief valve on top of a filter, if it allows air to accumulate in the filter tank. Many filters do not have an automatic air relief valve on the lid. The lack of an automatic air-relief valve increases the likelihood of an explosion. Filters without an automatic air release have an even greater need to be equipped with a safer fastener, such as bolts and wing nuts.

• *The clamp system is susceptible to misuse and failure*

A common defense in these cases is, as usual, to "blame the victim." Manufacturers will point to homeowners overtightening the clamp systems, which can weaken the threads on the screws of the assembly. Or, the defense may argue the victim misassembled the clamp. But these are circular arguments, as they are foreseeable misuse.

Manufacturers are aware of how easily a layperson could overtighten or reverse-align the components. Moreover, a product with the potential to take a user's head off should not be so vulnerable to a common user error.

• *Securing it with nuts-and-bolts was technologically and economically feasible*

Lugs and nuts are technically feasible, economically practical and safer than a clamp. Competitor filter manufacturers have used the design in Figure 4.

Lugs and nuts would eliminate the risk of serious injury. When a lug or nut fails, the remaining lugs and nuts hold the lid and bottom together. At worst, a failure of one nut would cause water to leak from the filter. A manufacturer's PMQ will likely testify that there were no technological impediments to a nuts-and-bolts system.

Additional issues and theories

In addition to pursuing product liability against the manufacturer (or possibly the component-part manufacturer, if a component of the separately-manufactured clamp system fails), there may exist other causes of action.

With respect to product liability, manufacturing defects may involve defective workmanship (bad spot weld, bad thread, etc.); parts that fail to conform to specifications (wrong metal or cut), and the like. For defective design claims, often the filters will suffer from a weak fastener, a confusing fastener; or confusing instructions with respect to the clamp assembly or pressure relief valve. Similarly, a design-defect may include an inadequate pressure-relief valve

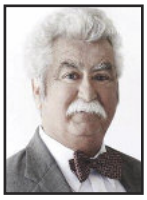
Figure 4

A safe system would have multiple lug and bolt clamps to create multiple redundancies and eliminate the chance of explosion or sudden separation.

(valve too small to allow air to escape quickly enough to release pressure), or a poor air-relief valve design.

In failure to warn cases, often the owner's manual and other written materials will contain conflicting messages, which confuse the user.

Don't overlook negligence against the pool filter installer. Such cases may include installing the filter shut-off switch within the "zone of danger" above the lid, or using pressurized plumbing that increases the pressure in the system.


Lancaster

Acknowledgement

The authors wish to acknowledge that the pool filter cases were pioneered in the Veen Firm office over a decade ago by attorney Kevin Lancaster. Lancaster is professorial in his knowledge and facility with the technical issues in these cases, and his ability to explain complicated mechanics and physics concepts to laypeople is legendary.

One successful example was his demonstration to an audience of defendants, defense counsel and insurance adjusters, using a toy "water rocket launcher," that pumps air and into a rocket partially filled with water. These $5 toys generate enough pressure that a child can shoot the rocket several hundred feet in the air – just from pumping air into the chamber. This made it abundantly clear to the defense how effectively the jury would be educated about the concept of the dangerous levels of pressure that can build from mixing air and water in pool filters, and a very substantial settlement followed shortly.


Label

Anthony L. Label is a trial team leader at the Veen Firm, P.C., *in San Francisco, CA. He represents people with severe personal injuries that have had a life-changing, career-changing, life-ending, or career-ending impact. He represents plaintiffs in actions arising from construction site accidents, industrial accidents, dangerous premises, auto accidents, wrongful death, governmental or public entity liability, defective products, and others. His awards include: SFTLA Trial Lawyer of the Year Finalist (2017); Super Lawyer Top 100 List (2015, 2016); Super Lawyer (2012-present); National Trial Lawyers: Top 100 Trial Lawyers (2013); Distinguished LRIS Panel Member Award, for the largest recovery in the history of the Bar Association of San Francisco's lawyer referral service program (2012); among others. He is the current President of Francisco Trial Lawyers Association (2017), and served on its Executive Board (2012-2016) and Board of Directors, (2005-2012). He is on the Board of Governors for the Consumer Attorneys of California (2015-present) and is a member of AAJ and Public Justice.*


Vallejo

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