

Pool Filter and Heater System



Equipment Description

Almost all above-ground and in-ground swimming pools use filters to maintain the water purity. Some filters are also equipped with a system to maintain a desired temperature range.

Most filter systems have an electric motor-driven pump that circulates the water from the pool through the filtering system and back to the pool. The filtering system will usually use a combination of skimmers and other gross debris catchers and smaller plastic based mesh filters. Filters also use a pass-through sand or diatomaceous earth media bolstered by a fabric or plastic mesh pass-through structure to clean the water. The pump(s) are usually controlled by adjustable timers and temperature sensors. The pump suction may be taken at the surface of the water (skimmers), at a low point in the pool, or both. In addition, many pools use a separate motor and pump unit to operate pool bottom cleaner.

Pool heaters are typically small heating boilers that may use natural gas or propane for fuel or may be electrically heated. The pool water is passed through the heating boiler and the amount of heating applied is controlled

by pool water temperature sensors. Pools may or may not be equipped with a passive solar cover which can dramatically lower the need for pool heating.

In addition to filters, salt-water pools utilize a salt conversion “generator” to produce algae- deterrent chemical balances. A properly operating salt-water pool can practically eliminate the need for chlorine chemicals that are required to maintain chemical purity of fresh water pools.

Loss Scenario

Pool filters require regular maintenance to prevent clogging and overpressure conditions, which can prevent the filter from properly cleaning the pool water. Clogging and overpressure can also cause pump overstress and failure of the drive motor. Even if all pool equipment is operated and maintained properly, the pumps, motors, boilers, and “generators” all have a relatively short lifespan, typically 10 years or less.

Size and Carbon Footprint

Though pumps are typically three horsepower or less, the rated size and electrical loading of a pool pump can vary widely. These ratings are dependent upon a combination of many factors such as the size of the pool; the desired flow in gallons per minute; the size of the discharge pipe; the discharge head pressure against the pool filter media. The filter operating hours also vary widely from about three to 12 hours per day, depending upon environmental conditions. In addition, natural gas and propane-fueled pool heaters are far more efficient than

electrically heated units. Given all of the variables, a “typical” pool filter energy use will vary greatly. However, swimming pool filtering electrical usage for a moderate sized pool can easily average over 700 kilowatt-hours per month with an equivalent carbon dioxide (CO₂) output of 1,064 pounds per month. That number excludes any energy consumption from the pool water heating.

Maintenance Tips

- Ensure (daily) that the pool leaf and debris catchers and the line gross filters are unobstructed to allow proper water flow to the pump(s).
- When a sand type pool filter shows a reading that is eight to ten pounds higher than its start-up level, it needs to be backwashed to get rid of dirt and debris.
- Use pool heating equipment only when necessary in order to reduce both energy cost and CO₂ emissions.

Loss Prevention Tip

- Adhere to recommended operation and maintenance requirements provided in your owner’s manual. If you don’t have a manual, contact the manufacturer to get one.
- Maintain proper pH and chemical balance of water to avoid algae buildup which could lead to filter motor failure.
- Pay close attention to filter maintenance requirements and pressure guidelines to reduce stress on the pump(s) and motor(s).