

Comparative Review of Selection of Techniques for Swimming Pool Cleaning

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Abstract – This paper comprises of a comparative review of swimming pool cleaning methods. The comparison is based on aspects such as cleaning efficiency, type of labor used, time taken for cleaning and cost. Upon doing thorough research about cleaning methods used to remove the algae formed in swimming pools it is found that the robotic swimming pool cleaner is the best option. It does not only clean the swimming pool but also saves a lot of time, money and effort.

Key Words: Manual brushing, Handheld vacuum, Automatic suction, Pressure Vacuum, Robotic Cleaner, In-floor Vacuum.

1. INTRODUCTION

To keep a pool, you will want to filter your water and maintain your filters. Basic swimming pool maintenance includes washing water, cleaning the vinyl walls, keeping filters maintained, and clearing out the areas around your pool. Regularly cleaning your skimmers and pump baskets is essential for the overall maintenance of your pool. Every so often, you should also clean out the pump baskets on the pump of the pool. To clean your skimmer basket, just shut down the pool pump and remove the removable basket underneath the skimmer cover, and replace it. Remove debris from your skimmer basket (if you have a pool, you likely know where that basket is). To clean your pool yourself, scrub the surface of the water daily with your net to remove leaves and other floating debris. Skimming the water every day will keep the debris from sinking to the bottom of your pool.

For weekly maintenance, a pool owner should take time to scrubbing the surface of the pool with the skimmer. The next step in the three-part swimming pool maintenance is cleaning, which involves brushing your pool, skimming the debris from its surface, and vacuuming your pool. This is a very important mechanical cleaning step which helps to eliminate all the build-up and algae on your pools walls. Brushing forces stick-on mud and algae back into the water, making it easier to get rid of with chemicals or with a pool vacuum. Even if you are using sanitizers in the pool to keep your water clean, these chemicals will wear off over time, so you will have to add it regularly. If you are using an ionizer, you still need chemical sanitizers, such as chlorine, to shock the pool regularly. Because you want to keep your pool

clean, you will want to add chlorine tablets and adjust your pH levels (based on the initial reading). You will want to maintain stable chlorine levels in order to keep your pool cleaner. To make this easier, choose a testing kit, which tells you whether or not you should add any chemicals to the pool in order to keep your water balanced.

Pools should be hosed down weekly to keep water clean and to decrease the amount of chemicals that need to be added. You do not need to manually vacuum your pool because it uses your pools pump and filtering system, so you are saved from the hassle of cleaning it afterward. This device works by cleaning your pool using the water that comes out of your filtering system. Use a dedicated pool deck cleaner and a stiff brush to clean your pool deck thoroughly. You can also brush the floor of the pool if you do not have, or choose not to use, a vacuum. Always follow manufacturer's instructions, or your pools installers recommendations for cleaning. This is a labour-intensive, but extremely important, step to clean a pool: Brushing helps to keep algae and other gunk out. No matter how much skimming, brushing, or vacuuming, if the filter of your pool is dirty, then your water is dirty. If you take some simple steps to ensure that the pool water is clean, you and your family/friends will be always ready to jump in.

1.1 Methods to Clean Swimming Pool

A. Skimming and Brushing

This method includes the skimming of the pool surface, which means cleaning out the leaves and the debris on the surface with the help of a skimming net and a telescopic pole. This process should be carried out on day-to-day basis. After this procedure the brushing part comes. In brushing the walls, the bottom and the pool ladder must be cleaned with a brush attached to a pole by applying force.

B. Vacuuming

After brushing all the debris gets on the bottom of the pool which needs to be taken out for this the vacuum is used which sucks out all the debris from the bottom of the pool. The pool should be vacuumed once a week.

C. Managing Chemicals

After all the cleaning procedure and removing of the debris, there have been certain chemicals added to the pool to maintain the cleanliness of the pool because of which the pH level need to be checked thrice a week so that the pool is safe to use. The pH level of the pool should vary between 7.2 and 7.8. All the debris and grime should be removed from the pool filter so that it will work more efficiently and then the final step comes of adding the chlorine. It takes somewhere about 5-6 hours of time to clean the swimming pool.

2. Classification of Swimming Pool Cleaners

There are many methods to clean swimming pools, from basic cleaning by hand to automatic cleaning robots as the technology advanced. But in general, the most commonly employed cleaning schemes are; brushing manually, handheld pool vacuums, automatic suction vacuums, pressure pool vacuums, robotic pool cleaners, and in-floor vacuum systems. There are many options to select from, but which is the best way of cleaning your swimming pool?

Let's dive deep into the mentioned methods. The first one is the most obvious and most ancient way of cleaning pools, i.e. manual brushing. A man brushes the dirt and algae formed on the floor and walls of the swimming pool. Removing fallen leaves and other trash can be done by using skimming nets. It requires a lot of hard work and consumes too much time. It is sensible for small pools or spas. It is a great workout and fairly inexpensive. If it is a big pool, then it is difficult to reach and clean all the whole surface area, therefore more than one man is needed for this job and a lot of efforts is required to clean the wall of the pool and there is still no assurance that the pool will be properly cleaned. This brings in the economic factor of paying someone to do this job. It is not so pocket-friendly to employ someone on regular basis and have to pay on an hourly basis to do such a simple task. So, further advancement in technology was to add to the idea of vacuum cleaners just like those used in indoor floor cleaning. This became the handheld pool vacuum. Like the vacuum cleaners used inside our houses, this pool vacuum cleaner has a built-in filter, a debris trapping compartment, suction heads and bristles, and is attached to a long handle to reach the bottom of the swimming pool. There are options for both plug-in and battery-operated types. The worker has to move the suction head attached with bristles on the walls and floor of the swimming pool similar to that of our homes. It does not have a roller brush so there are no mechanical parts in this system so they cost a little less than others. As compared to fully automatic cleaning systems they are less expensive and for the rechargeable ones costing just less than the automatic ones. Further advancing with time, this would mean instead of maneuvering the vacuum manually, the suction pump is fixed at a single position with the pool circulation pump being ON at the same time, the vacuum is moved along the swimming pool collecting debris inside the pool. The

collection of waste is totally dependent on the existing traditional filtration system. This type of systems are moderately costly and if you opt for a wall cleaning one it adds up the price. The next one is the pressure pool vacuum. These come with its own filter bag and does not rely on the pools filtration system. They come in battery operated or a plug-in option. It has wheels at the bottom to easily move around the pool floor. They are very good for thorough cleaning. Although these type of cleaning systems are a bit pricey they have their advantages. The best way of reducing human efforts is to employ a robot, the robotic pool cleaner comes in both automatic and remote driven options. They are the most popular cleaning types nowadays which is obvious. It has its own motors to propel, so no need to drag the vacuum around manually. They have their own suction pump motor as well. They can be used for floor and walls as well. They are the most energy efficient in cleaning category. They are the most expensive external item for cleaning swimming pools. But they do the job spotlessly. The last one is the in-floor vacuum system, they are needed to be fitted during the construction of the pool. With the help of jets all the debris is filtered out using the pool filtration system. During operation, a high pressure wave of water is generated which forces the debris to move along with the wave and is filtered out.

It is the most expensive one since it is installed at the construction of swimming pools. It requires the filtration system to be cleaned regularly which adds in on the cost. Even being the most expensive system since it is installed at the time of construction of the swimming pools it does not clean the grime and algae from the walls and the bottom of the pool.

3. Evaluation

A. Manual brushing

- As compared to other methods it is the least expensive way to clean a pool. It is most suitable for small or above ground pools. Tools required are much cheaper.
- Labor intensive, requires frequent cleaning
- Manually cleaning gives self-satisfaction of cleaning extent, thus it is only logical for small swimming pools

B. Handheld Pool Vacuum

- In mechanical operating system it is the most affordable option. More powerful than many automatic systems. No need of filtration system as it has its built-in filter.
- Suitable for any type of pool.
- Does not work automatically, requires manual operation. Thorough cleaning can take several hours

C. Automatic Suction Vacuums

- Least expensive in automatic system. it is durable and long lasting Easy to use and maintain .it is best suitable for in-ground pools

- Consumes more electricity. it relies on pool filtration system.

D. Pressure pool vacuum cleaner

- It is best suitable for pools with lots of debris. Has internal filter which is good to collect large debris. Easy to clean and maintain

- Moderately expensive. It requires additional booster pump to work effectively.

E. Robotic Pool Cleaner

- It does not require any pools pump connection. Some types are programmable for automatic operation. Due to self-filtering there is no load on pool filtering system.

- Most expensive automatic cleaner. Small filtering capacity, requires frequent cleaning/changing of filter.

F. In-floor vacuum system

- Entire cleaning is automatic and requires no maintenance

- Adoption of this type needs to be pre-planned and most expensive. It does not clean the grime and algae.

4. CONCLUSION

Maintaining your pool's hygiene is important so as to avoid health issues that can result from dirt and bacteria. In any case, you need to have a hygienic sense with home and commercial facilities alike. So considering the above factor, Robotic Pool Cleaner stands out from the rest of the technologies, as it is programmable to operate automatically or can be used as remote operated device. With minimum efforts the pool can be cleaned efficiently. It is the only technology which does not require pool pump connection and also has its own.

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