

The Inground Book

An Inground Pool Buyer's Guide

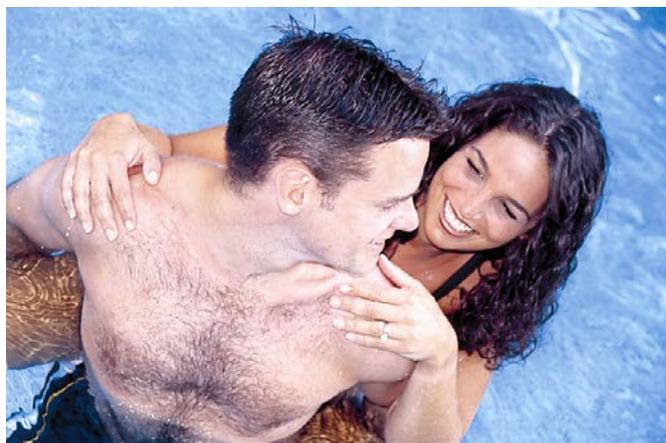
By Dennis DiPaolo



YOUR BACKYARD VACATION

Make waves this summer – with healthy outdoor fun and right in your own backyard! Millions of American families have already discovered the home swimming pool, and consider it as much a part of summer as ice cream and fireworks.

A swimming pool is one of the best ways for children to play – and its good **clean** fun. Let a few of the neighborhood kids come over; at least you know who your children’s friends are!!



There are few things these days that can help keep a family together like a swimming pool. Barbecues and pool parties give everyone a chance to enjoy the pool, and there’s no packing or driving or crowds. For the cost of a one week vacation, you can have a mini-resort in your own back yard – at your call, any day, any time.

Take a half hour to relax in the pool after work – it can put a whole new light on the rest of the night. Speaking of which, the water will be feeling pretty warm at night, perfect for the occasional midnight dip when the kids are all asleep.

Swimming pools have come of age. These days, taking care of one is as easy as pie. With the right filter, chemicals and an automatic pool cleaner; you can have sparkling clean, cool water for pennies a day, and perhaps an hour a month in maintenance.

Sit back and relax. Put a cool drink in the arm of your pool lounge, and soak up the rays, at your home, in your pool, anytime you wish!

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Which is better, inground or above ground?

An above ground pool is a pool – for swimming, playing, enjoying. An inground pool is an addition to your real estate, with everything that goes along with that. It changes your taxes, property values, resale price, etc. It's permanent. Inground pools start at around \$15,000. However, once you deck, fence and landscape, you're usually pushing \$30,000 to \$50,000. If you do a nice job on the landscaping; inground pools are prettier, easier to maintain (they use better equipment), and easier to entertain around. If you do a bad job, it lowers your property value and makes it more difficult to sell your home (ask any real estate agent). But it still raises your taxes.

An above ground pool is a great place to start. It is not every expensive, it gives you all the pool that you need, and it doesn't affect your property value. If you move, you can take it with you, sell it with the house, or even sell it through a classified ad. At the moment, hardly anyone taxes above ground pools, unless you build such a large, permanent deck around it, that you lose the "portability" argument with the town. Just to be on the safe side, however, check with your own town for their current opinion.

For more information on above ground pools, ask for our Above Ground Pool Buyer's Guide.

Which is better, vinyl liner or gunite?

It depends on where you live, who you are trying to impress, and your chances for vandalism.

In the south, gunite pools are cheaper than vinyl pools, while in the north, they are more expensive. Gunite is a form of concrete that is sprayed into a hole in the ground in order to make a pool shell. A finish, like plaster, tile, or glue and stones is then spread over it to make the shell waterproof. In the south, this is a pretty simple job, with a minimal amount of steel wire reinforcing in the concrete. In the north, we have to keep the pool from cracking due to ice pressure. That requires a lot more steel, concrete, and expertise.

Vinyl lined pools do not crack from ice pressure; there is enough "give" in the walls and liner to just flex slightly with the pressure. So vinyl lined pools are the same price wherever you live.

Lined pools can be cut, causing a leak. Now that does not happen very often in normal residential use – maybe once every ten or twenty years. And, it can be permanently repaired with a chemical weld in three minutes, for around five dollars. In a hotel, health club, or city pool, however, vandalism is a much more likely threat. In that case, the gunite has a big advantage.

Gunite pools do offer you the option of infinite customization. There are no specific sizes; just dig a hole and spray in the gunite! So you can be the only person in the world with your specific pool. Free form and kidney shapes are actually easier than rectangles, because you actually can not tell if they are off by a few inches without a blue print – but anyone can tell if a straight line is crooked.

Vinyl lined pools are available in hundreds of shapes and sizes now, so that you can still get a kidney or free form shape. It just requires more precision on the part of the builder, because the liner won't fit right unless the walls were built right.

Gunite offers you a wide variety of interior finishes: any color plaster, rocks, tiles, paint, etc. (hint: never paint). Vinyl now offers the same selection; except the vinyl will be printed with photographs of tile or rocks instead of the real thing. So an inexpensive vinyl pool does look cheaper than a gunite pool, but a nice vinyl pool can look just like a gunite pool.

Construction techniques do vary. Generally (though obviously not always) gunite pools are built by general contractors who use subcontractors for every part: excavation, steel reinforcing, gunite spray, plumbing, electrical, plaster, tile work, decking. If you leave three to seven days between each trade so that they do not develop wasted time if one is delayed, it can take a month to complete your pool. Vinyl companies will generally use the same crew to do everything except possibly the electrical and the deck. That means installation in a week or so. In the long run, I would call that a difference, not necessarily a better or worse. Once your pool is built, you'll forget about how long it took.

Maintenance on the two types is very different. Not counting holes in the liner (as we discussed above), vinyl liners don't require any

special maintenance until the liner finally dies. Figure 16 to 25 years with chlorine or bromine chemistry, or maybe 20 to 30 years in a PHMB (like Baquacil) environment. Then, you replace the liner for maybe \$1800 to \$2500 or so.

Most finishes on gunite pools, particularly plaster, are chemically “alive”. They are affected by water chemistry and they also affect water chemistry. Like a carpet, very light colors and very dark colors discolor easily. They can become pitted or scaling, causing good places for algae to grow, or even cut your feet. You can avoid or at least dramatically reduce this by taking good care of your pool and its water.

The repair for this is an acid bath, in which the top layer of plaster is etched off – like compounding a car finish. That’s maybe \$600 to \$1000. And, like compounding a car, you’re only going to get away with this two or three times, and then you’ll need to re-plaster to the tune of maybe \$1500 to \$2500 or so. How often do you acid wash? It depends on how well you take care of your pool, and how much the stains bother you. Average, maybe about ten years. If you have to do it in two years (it is possible) that would probably convince you to take better care of it in the future!

So what do I think? For commercial use, go gunite. For residential use, go with a really nice, expensive gunite with beautiful landscaping, a built-in spa, waterfall, etc. In other words, really high end. In that case, you can also afford the maintenance – and hiring someone to do it for you. If you are more of a do-it-yourselfer, go with the lower-maintenance vinyl lined pool. But try to upgrade to a cool shape. We’ll talk more about why later in the next section.

How do I design a deck and landscaping? How do I choose a shape and size?

First, be careful. This is actually your most important decision in terms of your property value. You can always improve your landscaping before you sell your house, but you can’t change the shape, size, and position of your pool.

Don’t build a plain old rectangular pool centered on your house and parallel to it. That’s what everyone does, and it’s boring. If you don’t have it in you to build a kidney or free form, try

round or octagonal. At a minimum, jazz up a rectangle with Roman or curved ends. The goal is to make your house look more expensive.

Consider putting your pool at an angle to the house, or at least not centered. Give yourself one or two large deck areas – which will probably give you two or three small areas. That’s okay – asymmetric usually looks better.

Involve the deck and landscape designers before you commit to the pool’s shape and position. People with an eye for design may be able to guide you. All three designs should work together, which is much easier if they are created simultaneously. If your landscaper has not worked with a lot of pools, make sure he or she considers how their fertilizers are going to completely screw up your water chemistry; causing algae to grow. Shedding leaves will block up your skimmer and automatic pool cleaner.

Where’s the best place to put my pool?

Well, first it should be legal; zoning, setbacks, fences, etc. See our *Do I need a permit to put up a pool?* section for details. You can’t build over utilities, septic tanks, and leach fields.

Avoid putting it under, or even close to; overhead electric lines, trees, plants, and shrubs. Why let wires, dirt, leaves, and fertilizers fall into the water?

If at all possible, try to put it in the sun as much of the day as possible. Watch where the sun shines and shadows fall every couple of hours for a day, and you’ll get a handle on that. It’s easier to keep your water warmer when the sun heats the pool walls. For that matter, try to avoid prevailing winds that will cool the pool.

Realistically, most people only have one spot big enough, so that’s where it’s going to go! Other things to think about: the closer to the house, the shorter the ditch for the electric outlet and the shorter the distance to carry the hot dogs and lemonade for pool parties!

With a vinyl-lined pool, which walls are best: steel, aluminum, resin, or concrete?

Steel is strong, but it can rust. Aluminum does not rust, but it’s weaker, and it does oxidize somewhat in alkaline soil. Resin does not rust or

oxidize. It makes curves precisely, but it can crack. Concrete is by far the strongest, but it's rough, it cracks, and it does not allow for as wide a variety of interesting shapes. Plus, the wall material is not as important as the construction techniques. The wall really doesn't do that much: mostly it keeps the liner uniform and holds back the dirt. Once you get down to the bottom, in fact, the pool really is just dirt with a covering to protect the liner.

A good construction technique will tie the wall together with a lot of concrete; either all the way around, or at the stakes that hold the panels in place. If you are going to have part or all of a wall above the ground, a solid concrete wall would probably be best: say ten or twelve inches thick, like a house foundation.

I'd be more inclined to choose a builder who I thought would do a good job, and use the wall and construction technique that the builder recommended.

What about those big bathtub-type one-piece pools?

Not bad if you live in the right spot; with nice, sandy soil. They do tend to be very small, because they have to get under bridges and telephone poles, and the transportation difficulties raise the price as you live farther and farther from the factory. The finish should last a long time, but it still won't last forever. Figure maintenance costs more like a vinyl-lined pool. Don't ever leave it empty during the winter: a rising water table (which tends to happen in spring) could pop it right out of the ground like a big boat. Putting it back could cost more than the original installation.

I want a diving board, and everyone's giving me a hard time about it. Why?

The builders probably don't feel like losing their home and their business because some idiot got drunk and broke their neck in your pool. It doesn't matter if you sign a disclaimer – you can't sign away the ability for a guest or even a trespasser in your yard from suing. And if they sue, their lawyer will go after everyone who ever touched your pool.

If you really, really want a diving board, keep insisting. Most builders will give in rather

than lose the sale. Expect the deep end of your pool to be huge, though, in order to make diving safer. Consider this: one person using the diving board is tying up $\frac{3}{4}$ of your pool, while everyone else is in the shallow end. And what do most people do in a pool? Stand and talk, play basketball or volleyball, and float in a chaise with a drink in the arm. None of that requires a deep end, and some of it is hard to do in a deep end. Consider this also: I think that you are out of your mind to put a diving board on a pool.

What's the most important thing to look at, that no one ever looks at?

Look under the hood: plumbing, circulation, hydraulics. They're underground. They're not sexy. No one talks about them. And if they are second-rate, you can't fix it, because it's underground. A well-designed pool will move all of the water in the pool uniformly through the filter, heater, and chemical system. A poor system will keep circulating the top 15 inches of water, and hardly ever circulate the bottom 24 inches.

It's not enough to have a main drain. A pool with two skimmers and a main drain is probably taking 90% of its water from the skimmers and 10% from the bottom, because there is a huge amount of resistance caused by trying to suck water up nine feet vertically. Pumps do not suck water up very well. That's why well pumps are at the bottom of your well and not in your cellar.

Hydraulics is too complicated a subject to teach you here, and your builder may not even understand it – there is no licensing requirement to be proficient in hydraulics in New Hampshire (Live Free or Die). Ask what thought that builder has put into it – and it will have nothing to do with a bigger filter. The most water a 100 gallon per minute pump can put through a 40 gallon per minute pipe is 40 gallons per minute. After that, you are just wasting electricity and over-heating the pump. In fact, do not be impressed by a high-horsepower pump. It's an easy way to impress the consumer for \$50 on a \$20,000 job. What you need is a pump, filter, hydraulic design, heater, etc. that are balanced.

If the builder uses a wider pipe coming from the bottom than coming from the top, it shows that

they made an effort to balance the hydraulics. Or perhaps he or she used valves, corners, or multiple pipes to spread out resistance. I wouldn't worry about checking the accuracy of their calculations. Just see if they actually thought about the subject, and if their explanation even seems to make sense.

What are good deck materials?

To keep up your property values, you want rich decking that goes with the theme and design of the pool. Avoid smooth or shiny – it's dangerous when wet. Dark colors get hot when you're trying to walk with bare feet. If you think you might ever want one of those bolt-on elephant-type safety covers, be careful. Some decks, like pavers set in sand, are really difficult or impossible to use with the bolts. Normally, safety covers require a minimum of three feet of solid concrete all around 90% of the pool. Best bet: get the pool builder to quote the safety cover at the same time. You don't have to buy it then, but quoting it will force the builder to deal with making the pool design work with the cover's requirements.

Every once in a while, we refuse to sell and install a safety cover on a pool because the original pool deck designer made it completely impossible to do a good, or safe job on that particular pool.

Which filter is better: sand, DE, or cartridge?

The purpose of the pool's filter is to keep the water clean and clear by removing dirt, algae, particles, and other stuff that makes the water cloudy. Diatomaceous Earth (DE) takes out much smaller particles much more quickly than any other filter. Take a look at a bottle of filter sand and a bottle of diatomaceous earth. The difference is apparent. On this, there is no question, end of discussion.

DE removes particles down to three microns, all the time. A micron is very small – a millionth of a meter. Cartridge filters work down to 40 microns only when they are working correctly. Sand filters work around 100 microns right after they are backwashed, and get down to about 75 microns when they are dirty. Shocking, which is a chemical oxidation done to pools weekly to

monthly, burns off organics (which is mostly what is that small in a pool) up to two microns.

So over time, pool water will build up anything above two microns, and below 3, 40, or 75 microns, depending on your filter. Then what happens? If you have a sand or cartridge filter, some day, perhaps in a few years, there's enough of this material in the water to give it a light haze or cloud. Then you drain the pool, borrow a DE filter for a few days, or start using a clarifier or filter aid on a regular basis. So why doesn't everyone just use a DE filter? Because they are more expensive.

Cartridge filters clean the water better than sand, and are fairly inexpensive to buy. Supposedly, they are better for the environment, but that's sort of a "Paper vs. Plastic" argument. If you use tap water to wash them off, they put fewer chemicals into the environment. Then, someday, you put the old cartridge into the trash and it goes into the landfill for 1000 years!

In my experience, cartridge filters are easily overwhelmed by an algae attack. When they are old and soft, they allow dirt to go right past the cartridge and back to the pool. Most of the owners of cartridge filters that we know (mostly on spas and small pools) are constantly fighting cloudy water. When you only have a few hundred gallons of water, draining and starting over is not a big deal. When you have 20,000 gallons of water, it is!

A sand filter is a very simple apparatus – it's basically an empty bucket filled with sand. As water passes down through the sand, dirt is caught in the spaces between the pieces of sand. When the sand is full of dirt, you flush it out by running the pool water backwards through the sand, and out onto the ground. This operation – backwashing – is done roughly once a week, and uses about 50-100 gallons of water. Obviously, how much and how often is variable and depends on usage, etc. Sand can be reused for a number of years, but it's actually cheaper and easier to throw it away in fall and replace it in spring (maybe \$10 to \$30 per year, depending on filter size). Sand filters are very easy to operate, except when you're changing the sand at the end of the year.

A DE filter is internally much more complex, though you rarely actually open it up. Diatomaceous Earth is a white powder found in

huge beds in the ground on the west coast. It is made of the fossilized bodies of diatoms – microscopic animals that lived in the Pacific Ocean millions of years ago. It is used most commonly by nurseries as mulch, in restaurants and food service to filter cooking oil and clean grills, and on large commercial pools and hot tubs where absolute water clarity is very important.

You will probably backwash your DE filter as often as a sand filter. Two differences: it will probably only use half as much water, and you will then replace the flushed-out DE by adding a few scoops of it into the through-wall skimmer. DE is very inexpensive – about \$15 a summer should do it.

The real differences? Sand filters are less expensive to purchase, though slightly more expensive to operate. They will generally keep the pool water clear, though probably not as **sparkling** as the water cleaned by DE. If you should develop a major cloudiness or algae problem, the sand filter will probably not develop a major clogging problem. In the same situation, the DE filter would clog up two or three times a day for two or three days – until the pool was clear. Of course, that's because the DE filter was clearing up, in two or three days, what the sand filter was going to take a week or two to accomplish.

The new “permanent media” cartridge filters will probably keep the water cleaner than sand – with no backwashing ever. However, all water research suggests that they should still be chemically cleaned twice a year even if they are not yet overloaded with dirt.

Here's the problem: Just because you **can** hold a year's worth of dirt, algae, bacteria, skin cells, bugs, and other gross stuff in your filter does not mean that you should **want** to. Even though you don't see all that stuff; you're swimming in water that runs right through it all three times a day. You can end up growing slime, infections, and smells in your pool water that came from your filter cartridge. You can fix that with more pool chemicals, but why have to?

The big cartridges don't have to be replaced all the time like the small cartridges, but that doesn't mean that they last forever. The first four

years seem cheap enough, but a \$150 bill in year five can be a shock!

Do I need a permit to put in a pool?

This is America. You need a permit to go to the bathroom! I'll be happy to tell you what you generally need, but it makes no difference what I say. It only matters what **your** town hall says. Call them immediately, and request a copy of whatever their particular regulations are, and follow them. Your builder will probably insist on pulling the permits for you, to make sure that it's actually done right.

Generally, the town's interest is in preventing you from annoying your neighbors, creating a health hazard, and costing the town money. They will generally want the pool far enough from the lot line so that you can't splash water on the neighbors. If it's an issue, find out if they call the edge of the pool where the deck starts, the pool's frame starts, or the water starts. Sometimes if you're off by inches, that could make the difference.

They definitely won't want the pool over a leach field, and probably not over a water line, sewer line, or other underground utility. Here, they're looking to avoid problems if a utility line ever needs to be dug up. They may or may not care how close the pool is to the house or other buildings.

The electrical work is also going to require a permit. If you don't get a building permit for the pool, and your electrician does get a permit for the electrical work, you will very likely get caught.

Aren't pools unsafe?

Compared to ponds, streams, rivers, lakes, quarries, swimming holes, and the ocean; pools are very safe. The water is clear, you can see all the way to the bottom, there are no waves, and the edge is no more than seventeen feet away. Owning a pool encourages everyone to learn to swim **well** – and regular swimming is the best aerobic exercise. It's also low impact.

Safety is an important issue, and I have no intention of ducking it. First, some focus. Swimming pool accidents are very rare, but there are two relatively common types. The first is a two or three year old boy who falls into the pool. The

second is an intoxicated eighteen to twenty-five year old man who is injured diving. Both of these accidents are much more likely with an inground pool than above ground. A two-year old can't fall into something that's four feet above the ground, and most people, no matter how drunk, know enough not to dive into an above ground pool.

The American Pool and Spa Association has developed pool safety literature that should be available from any APSP member. There are pool alarms available that can provide a warning (sort of like a smoke detector) when they detect splashing in your pool.

Most important, though, is that you use the safety equipment. Don't drink and swim. Don't ever dive into shallow water. When you're out watching the kids, bring a cordless phone so you don't have to run back into the house "just for a minute". Pools always come with safety signs that warn others not to dive. Use them. If they fall off, get more. It's just common sense.

Aren't pools difficult to maintain?

Not necessarily. You can be a slave to your pool, or it can be a tremendous source of joy and fun – with maybe ten minutes a week in maintenance. It's certainly way easier than owning a boat!

Some people vacuum twice a week, some vacuum once a month, and some (with automatic pool cleaners) never vacuum. On the physical "housekeeping" side, pools are pretty easy. Keep an eye on the water level, have a quick look at the filter, brush or vacuum whenever you feel like it (or let the pool clean itself).

Here's the short answer: use a DE filter, a salt-to-chlorine generator, or a biguanide chemical system (Baqacil or SoftSwim), and an automatic pool cleaner. If you have the money, there are some amazing electronic control systems that can take a lot work out of pool care. You're at five or ten minutes a week, and you can skip the rest of this discussion.

Here's the long answer: most pool maintenance is chemical, or straightening out what happened because you didn't use the chemicals properly. There are three major chemical systems,

plus a few non-chemical or semi-chemical systems. They each require different amounts of work.

First, the **non-chemical or semi-chemical systems**: ozone, ionization, magnets, the dark blue mystery liquid, and voodoo. When they are sold as eliminating the need for an EPA-registered sanitizer to kill bacteria, it is not true. When they are sold as **reducing** the need for a sanitizer it probably is true.

However, the only method I've ever seen for keeping an effective amount of sanitizer in the water is by using close to the same amount as the people who didn't have the "gadget" on their pool, and testing at the same levels.

Systems that work by activating oxygen are working primarily while the water is in the "gadget", for a few seconds. They can meet drinking water standards, but swimming pool water standards are more difficult to meet.

The difference? In drinking water, we are killing bacteria before it enters a sealed pipe, and preventing new growth until it comes out the other end of the pipe (your faucet). In swimming pools, we are trying to prevent the transmission of disease between two people in the same water.

Killing bacteria in a pipe next to the filter is only helpful in preventing green water and preventing disease when the sick person stands right in front of the skimmer, and the not-yet-sick person stands only in front of the return, and the filter is always running.

I'm not saying that they don't work, or that they don't save you money. I just haven't seen a Board of Health or the EPA define how I could tell they're working. Yes, I have heard that NASA uses one of the systems, but if they had swimming pools in outer space, I just think I would have seen that in the Telegraph.

Chlorine is the cheapest of the three common chemical systems, but it requires the most work. If the pH drifts out of range, or if ammonia products build up in the water (sweat, urine, body oils, etc.) or if too little shock is used, the chlorine doesn't work. Heat and sunlight pull the chlorine right out of the water, so that it may not even be there at 4:00 in the afternoon in a heat wave (with the pool full of kids). Chlorine pools should be tested every day right before sundown, and shocked every seven to ten days. If you've ever had a friend

complain about how much work a pool was, it is quite likely they were using chlorine.

Salt generators are generating chlorine from salt. That means a “salt” pool is still a chlorine pool, and you are still taking care of a chlorine pool.

Their advantage is that you only buy salt every year, and a small amount of chlorine, because salt generators do not work at the beginning and end of the season, when the water is below 60°F. The generator turns the chloride part of the salt into chlorine in the pool. To shock, you push the shock button and run your filter 24 hours straight or so (by-passing your timer) until the generator has created enough chlorine to shock it.

Please do not think that this is an economic advantage. The difference between chlorine and salt costs might be \$75 a year for eight to ten years. Then you pay \$600 to \$800 for new electrodes. That’s why the generator cost \$1500 when you bought it; the electrodes are platinum! The advantage is in that you don’t have to store 35 pounds of chlorine in your cellar or pool shed.

Bromine is a halogen similar to chlorine, except it is not affected as easily by pH shifts or ammonia build-up. It’s more effective in heat, and doesn’t smell as bad. Testing every few days is acceptable, and shocking every two or three weeks is fine. However, bromine is the most expensive of the three systems, requires a machine to add the bromine, and is the only one that you can’t switch to chlorine without draining the pool.

Biguanide, or PHMB, is the medium-priced alternative. Unlike chlorine and bromine, which come in hundreds of strengths, forms, formulations and brands; there are currently only two major brands of biguanide in the United States; Baquacil and SoftSwim. In Europe, Africa, and Australia, where the patent ran out years ago, there are many more brands. Some of those brands are just coming into the American market.

Biguanide was originally developed years ago for hospitals as the Stuart Pharmaceuticals product Hypocleanse. Many surgeons wash their hands in it before surgery. It is very gentle to human skin while killing harmful bacteria instantly and effectively. Biguanide is also used in contact lens solutions to kill bacteria without harming the

eye. Imperial Chemical (the owners of Stuart Pharmaceuticals) developed Baquacil for use in swimming pools in the 1970’s, and brought it to the United States in 1983.

Biguanides are totally unaffected by pH, ammonia, heat, sunlight, or most other chemicals. They don’t smell, bleach bathing suits or liners, dry out skin or blow up! It can take three weeks for the level to go down enough to add more – and almost two months before it’s entirely used up. Testing once a week is plenty, and shocking once a month is fine. Biguanides are not perfect, though. They have problems dealing with bioslimes – a non-harmful but annoying family of growths that are even in our drinking water. And fighting them, for about seven percent of biguanide users, raise the price from medium to high!

Chlorine is great for people who have more time than money or view their pool as a hobby. It’s inexpensive (say \$70 to \$100 for a 10,000 gallon pool), and it works just fine if you keep up with it. Adding an ionization purifier will add \$90 a year, but will greatly reduce the chances of problems. Biguanide is best for people who have more money than time – or just want their pool to be more fun and less work. It’ll cost more - \$100 to \$140 for a 10,000 gallon pool.

How much does it cost to fill and maintain a pool?

Filling’s easy. If you have any form of town water, use that. To get the exact cost, call the water company, give them the amount of gallons, and they’ll tell you. Generally, a 20,000 gallon pool holds about \$90 worth of water. If your town has separate sewer tax that’s based on your water usage, tell them what day you filled the pool, and ask for a waiver on the sewer tax – since you’re not flushing the water into the sewer. This works in some towns. If you don’t trust your well, it will cost about \$400 to fill a 20,000 gallon pool using a good water company that will deliver drinking water. Be careful, some water delivery people will back up to a local pond to fill up. It’s cheaper (they’re getting the water for free), but it’ll cost you in time and chemicals to clear the water in your brand new pool. For the same reason, don’t use a fire hydrant. The stuff is full of rust! Your builder may insist on

trucking in water so that an entire crew doesn't have to waste two days hanging around your yard watching the pool fill. That labor cost could be higher than the water cost.

Electric costs to run your filter are difficult to predict – there's such a wide range of pumps. You'll be running five to twenty-four hours a day, so figure maybe \$25 to \$75 per month. A two-speed pump on a large filter can save you lots of money, as much as 40%. For a big pool, a variable speed pump is the way to go; saving maybe 60% or more, plus preserving the environment.

Chemical costs can vary, as I discussed in the previous section. With balancing, winterizing, and miscellaneous costs, I'd expect the owner of a 20,000 gallon pool will drop about \$300 every summer. Total for the summer; with chemicals, water, electricity and miscellaneous maintenance, most inground pools probably cost about \$500 a summer to maintain. Those numbers actually don't change a lot if you use cheap chemicals or equipment, either. Cheap chemicals make you buy liners more often. Cheap equipment makes you replace it more often. It all seems to work out in the long run.

What about heaters?

Everyone should have a solar cover. It's inexpensive, easy to use, and it will pick you up four to eight additional weeks of swimming – that depends on how you use the pool. It conserves water by preventing evaporation.

Gas heaters are now available for around \$2500. An excellent alternative for a smaller pool is an active solar heater that works off your existing filter. They're around \$2000 to \$5000, and the heat's free! Gas is faster, solar is very slow, particularly if it's cloudy. Heat pumps are extremely energy-efficient. The only downside is that they require a bit more patience getting up to temperature in April or very early May. They may take week to do what gas can do in two days. But after that, they will maintain just as well for way less money. If you can handle opening your pool the week before you want to swim, that's not a sacrifice. Oh, and if you cover your pool with a safety cover, you are going to end up opening it before it's really hot out, anyway.

What's a virgin vinyl winterized liner?

A liner. They're all virgin vinyl and winterized. Non-virgin vinyl (reprocessed) would have dirt and pieces of different vinyl mixed in, which would leave little holes in the vinyl. Even the worst liners made are still pretty virgin – maybe with some scraps of brand new liner melted down and mixed in.

There are, however, some very important differences in liners. Generic liners are more likely to wrinkle because they are made to a wider tolerance (to fit pools with differing shapes and final sizes). If a defective liner causes a wall to split, it's a lot easier to collect when they're both from the same manufacturer.

Companies that only make generic liners (without pools) are under tremendous pressure to make them as cheaply as possible. Liners are not made just out of vinyl. They have colorants to make them blue, U.V. inhibitors to keep the colors from fading, and plasticizers to keep the vinyl from becoming brittle with age and cold. Mildewcides and algacides keep microscopic plants from forming roots into the vinyl. Elasticizers allow the liner to stretch smoothly for a wrinkle-free fit. Some seaming techniques are much stronger than others.

Gauge has no real meaning in measuring a liner's quality. To a large extent, neither does warranty unless you read the warranty carefully. If it's prorated properly there's not much warranty left after three years – whether it's called ten years, thirty years, or triple lifetime! Does it cover just the seams or the entire liner?

Years ago, 20 gauge meant **at least** 20 thousandths of an inch thick, or 20 mil. Today, that same 20 gauge liner probably weighs less than it used to. Ask to see and feel a sample of the liner that comes with your pool. Ask for the actual, true mil thickness of your liner, in writing. It will probably look like a fraction, with the top digit representing the sides and the bottom digit representing the bottom.

Liners are often made with different material on the bottom than on the sides. The bottom generally is not required to stretch very much during the installation, while the sides are often stretched during filling and wrinkle removal. The

sides often have extra ultra violet protection, because the top of it is exposed to constant sunlight. The sides are usually thicker, too.

How important is the warranty?

Very, and not at all. Don't ever buy a pool just because of the warranty, especially if you haven't read it thoroughly and don't understand all the details.

You can buy a \$100,000 automobile and get a four year warranty. There are \$2,000 pools with forty years! That doesn't make the pool better than the automobile – it suggests that competition has driven all pool warranties to ridiculous lengths. They no longer have anything to do with the pool's quality or longevity.

First, most warranties cover defects in materials and workmanship, on a pro-rated basis. That means the defect has to be the manufacturer's fault – not yours, or an Act of God. Second, they are of descending value (like automobile tire warranties). You don't get a new pool in ten years – you get a **discount** on parts for a new pool in ten years.

When comparing two different manufacturers, a pool with a ten-year warranty could easily be a better made pool than another with a thirty-year warranty. Depending on how the warranty is written, the ten-year warranty may well give the customer better protection. Even within the same manufacturer, a thirty-year pool may not necessarily last three times longer than the ten-year pool.

Most important to any warranty is who stands behind it and how do you deal with them. How do you actually get the parts? I'd rather pay full price for a part that I can get, than get a 35% discount on a part that I can't get. Your questions are: How long has the manufacturer been in business? Does anyone else around here deal with the same manufacturer? Can you deal directly with the manufacturer, or do you have to go through the original dealer? Do you **have** to deal directly with the manufacturer, or will the dealer intercede on your behalf? Is there any labor included, or just materials?



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