

Koi Pond Filter

What filter should I use for my koi pond?

By Stephen M. Meyer

Q. I am planning on building a koi pond that is 12 feet long, 4 feet wide and about 2 feet deep. I believe that the koi pond will hold approximately 700 gallons of water. Can you give me some tips on selecting a filter for my koi pond?

A. Pond filtration is important, for several reasons. First, pondkeepers often maintain too many fish in their ponds, and the natural biological processes are unable to cope with the wastes produced. Second, the increasing costs and scarcity of water, coupled with increased demand and lower than normal snow and rain, has made large water changes impractical and expensive. Thus, the need to recirculate fish pond water through a filter.

The basics of fish pond filtration are similar to those for fish aquarium filtration. Mechanical filtration is used to remove suspended particles from the water and biological filtration is used to remove nitrogenous wastes that are dissolved in the water.

Owners of very small garden ponds containing no more than 265 gallons of water can limit filtration to a submersible pump in a 5-gallon bucket filled with half-inch gravel and placed on the bottom of the pond. This will work quite well as both a mechanical and biological filter, although it may have to be removed for daily cleaning. Larger fish ponds should have separate filters for each function, with water passing through the mechanical filter before it reaches the biological filter.

In addition to solid wastes produced by the fish, many things fall into the pond over the course of a season. Some items will settle to the bottom of the pond, while others will float at the surface. Natural decay will eventually break down these items, resulting in a layer of material on the pond bottom. This material can be easily resuspended in the water by the slightest disturbance, clouding the fish pond water.

Because there is so much suspended material of different sizes, a pond filter should be designed for coarse filtration so it will not clog rapidly and therefore require significantly more maintenance. There are numerous filter designs available.

One inexpensive but very effective mechanical fish pond filter is the Supreme Poolmaster from Danner Mfg. It consists of a foam sleeve around a hollow cylinder and a submersible pump to draw water through the foam-covered cylinder. The filter can handle ponds up to 500 gallons and is virtually silent. For larger fish ponds, several of these pumps can be ganged in parallel. The one drawback is that the foam sleeve is such a good mechanical trap that it needs to be cleaned every few days.

Another option is to use a swimming pool rapid sand filter (not a diatomaceous earth filter, which would require backflushing every hour!). Rapid sand filters work quite well, although they may need to be backflushed every day. A major drawback to these units, however, is that they are unsightly and incredibly noisy.

You might consider building your own mechanical filter. Sink a large plastic garbage pail into the ground next to your pond, or build a small secondary pond next to your main pond, to act as a settling basin. Using either submerged pipe or siphon tubes, bring the pond water into the settling basin or sunken pail, where it can pass through a series of mechanical screens (any material that allows water, but not solids, to pass through it) placed between the inlet and outlet of the filter. Particulate matter is either captured or it settles to the bottom of the filter. The pump for the filter should circulate at least one complete pond volume each hour.

Water exiting the mechanical filter should feed directly into the biological filter. There are many ways to design a biological filter, but the basic principle is to provide lots of surface area to support an adequate population of nitrifying bacteria on the media in the filter. My first preference is for large, plastic hollow spheres (often seen in the trickle filters of marine reef aquariums) because they offer a large surface area per unit of volume but have large void spaces that allow solids to pass through without clogging or channeling. My second choice is lava rock that is 1 to 1½ inches in size. Gravel that is ½ inch or less is commonly used but clogs readily and is a pain to clean.

The filter size required depends largely on the fish load in your pond. I would strongly suggest limiting the population to six or seven fish of no more than 12 inches in length, or two or three fish of 24 inches. There are many variables that affect filter design, but you do not need to concern yourself with them as long as the volume of media in the filter is about 3.7

cubic feet (for your size pond) and you adhere to the fish load recommendations above. The flow rate should also be at least one pond volume per hour.

I cannot honestly recommend any of the commercial biofilters on the market. They are effective but much too expensive. You can construct a much more effective biofilter yourself, and for substantially less money.