SEAGATE FILTERS
WATER FILTRATION TECHNOLOGIES

SeaGateFilters, Inc.
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Xtreme BioFilters vs Other Filters

1. Pressurized Filter vs Gravity fed filter

Xtreme BioFilter is a pressurized system. Pressurized filter wins over gravity fed filter many times over because of its compact size, combination of a mechanical and biological filtering capability, the ability of pushing a high volume of water through the filter, regardless of the location of the filter in respect to the pond water level, either up hill or down hill. With a standard 2 inch pipe, it can deliver up to 9000 gallons of water per hour. To some top mount filter, it can be buried to the neck for out of sight, hide-away from the pond make the landscaping of the pond to a more natural look. The convenience of a muliti-port valve makes it even more desirable because it can be changed from one mode to the other only with an instant turn of a handle. Cleaning of a pressurized filter is a snap. With a turn of a handle, it can be changed from a filter mode to backwash mode. Dirt and debris are flushed to the waste line. There is not filter pads removed and cleaned. You do not touch the dirty filter pads.
The cleaning of a pressurized filter takes less than 5 minutes each time. The amount of water used in backwash is about 2 -3 times of the filter volume. After each backwash fresh water is put back to the pond. It is considered as a periodic water change which is recommended for fish health.

On the other hand, gravity fed filter has many limitations. First, it is a large tank with some degree of conical bottom similar the vortex chamber set up. The maximum amount of flow rate can be achieved by a 4 inch inlet is 6,600 gallons of water per hour. In order for the dirty and debris have a chance to settle in the chamber, the diameter of the tank must be very large to accommodate the centrifugal force of water within the chamber. For example, a 6,600 gallons per hour flow rate will require a settle tank diameter of 4 feet and the tank height is approximately 65 inches (or deeper) in depth. This will take up a very large space. Beside, the tank must be buried (sometime a pit below grade is installed for this purpose) so that the level water of the in pond is the same as the level water as in the filter. This results in more labor and cost to install these type of gravity fed filter. Second, the gravity fed filter must be closed to the pond because water flow is slower as it is traveled in a longer pipe. If a bottom drain is installed, dirt and debris tend to settle in the lower part and along the length of the pipe before reaching the filter. Often a pipe blow out (or flush) is needed to prevent clog in the pipe. Furthermore, the large filter tank will make it difficult to hide or camouflage for a natural look to the pond. Third, gravity fed filter often utilizes some form of hanging brushes, filter pads, or screen for mechanical filtration, and for biological filtration, some sort of plastic media such as bio balls, ceramic rods, floating tubular type media such as K1 Kaldness media, etc… The mechanical filtering media need frequent cleaning involving removal of these brushes, filter pads, screen, for cleaning. The biological media need rinsing via backwash, flushing of the dirt and debris collected at the conical bottom of the tank. The cleaning process is laborious, time consuming and is not desirable.

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2. Xtreme Bio Media vs bead media or other tubular media

Bead media consist of small spherical beads which the diameter is about 1/8 of an inch. The outer surface of a bead is smooth. A cubic foot of bead provide approximately 300-400 square feet of surface area. Bacteria grow on the surface creating a bio film which is essential for the biological filtration in the filter. Beads are packed in a pressurized filter, since the beads are slight negative buoyant they float to the upper part of the filter. In Filter mode, dirt and debris are introduced at the bottom of the filter and flow upward. Dirt and debris are trapped within the bead media bed and the filtered water exits at the top of the filter. Over a period of time, dirt and debris trapped in the bead media bed become abundant channeling occurs when the beads are packed tight, and the mechanical and biological filtrations of the bead bed become ineffective. Anaerobic condition occurs within the bead bed because lack of water flow through the bead media bed, bacteria (or bio film) begin to die off and decomposition of trapped organic matters producing harmful toxins and gases which can be harmful to the fish health. Period cleaning of the bead media bed is required to remove dirt and debris from the filter. As often recommended by manufacturer, cleaning of a bead filter is required every 7 days. Since the surface of beads is smooth, they tend to stick together tightly forming a cake of beads. The use of a blower is often needed for backwash of a bead filter. The vigorous agitating action of rising air bubbles will break up the bead cake and send the dirt and debris to the waste line. However, this action also scrubs away the beneficial bacteria on the bead surface because of the scouring action during cleaning which results in losing of 25%-40% of the beneficial bacterial on the bead surfaces. Ammonia spike after cleaning of a bead media bed is typical and is not good for fish health. Ammonia level will take 2-3 days to subside to a normal level and then few more days the cleaning process begins over again. This roller coaster ride of the biological filtration treatment is very stressful for the fish.

Xtreme Bio Media are tubular, patented and designed for few good reasons. First, Xtreme Bio Media are made of plastic material which is slightly positive buoyant. The diameter of Xtreme Bio Media X250 is ¼ inch and the length is 3/8 of an inch (Xtreme Bio Media X125 diameter is ¼ inch and the length is ¼ inch) with ridges on the outer wall and 8 free standing fins on the inner wall pointing toward the center but not connected. The total surface area of one cubic foot of Xtreme Bio Media X250 yields 870 square feet (X125 yields 920 square feet) for great bacteria colonization, twice the amount of surface area as compared to that of bead media.

Xtreme Bio Media are very slight sinking, almost neutral buoyant, and packed at the bottom half of a pressurized Xtreme BioFilter. Dense packing of the media provides mechanical filtration, and with large amount of surface area, it also provides great biological treatment. The ridges on the outer wall of the media provide a stand off

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between adjacent media eliminate sticking between media, and allow the media to unpack with a minimal energy. The fins pointing inward on the inside walls provide the surface for bacteria to grow on. Water flows through the media bed through the outside as well as the inside cavity of the tubular media. Therefore, this type of tubular media eliminates channeling problem as indicated as in case of bead media. Minimize the anaerobic conditions within the media bed as the bio film is exposed to water circulation through the outside and inside of an individual piece of the media. The free standing fins on the inner wall pointing inward but not connected at the center of Xtreme Bio Media have no enclosed or partitioned walls, further provide a space for dirt and debris to be collected in this space and yet they can be readily flushed out during a backwash. This is a key difference in the design of the Xtreme Bio Media as compared to that of other similar tubular media which have finite partitions, walls, or compartments. Dirt and debris are clogged in finite partitions, walls or compartments and are very difficult to be flushed out. Replacement of these tubular media is recommended as they become clogged render the filtration ineffective.

Xtreme Bio Media bed stores more dirt and debris, eliminates channeling, good water circulation throughout the media bed, minimizes anaerobic conditions, allows good bacterial growth therefore backwash the Xtreme Bio Filter is required about once a month (backwash may be needed in a shorter interval depending upon fish and organic load and season). During backwash, the bio film is saved on the outside as well as on the inside wall of the media. No ammonia spike after each backwash.

3. Diffuser & equalizer column: Xtreme BioFilters use an entirely re-engineered diffuser/equalizer column assembly. Its performance sets it apart from the rest.

- Filter mode: In filter mode, Xtreme BioFilters, pressurized bead filters, and other pressurized filter systems including sand filters work in similar fashion. Dirt and debris got trapped in the dense packing of the filter media bed. Filtered water exits the filter and returned to the pond.
- Backwash mode: The major differences of the Xtreme BioFilters as compared to the other filters are realized in Backwash mode. The water enters the multi-port valve at the top of the filter, travels thru the 2 inch vertical pipe, exits at the bottom of the filter via angled slots of the diffuser head located at the bottom of the filter, forms water jets. Water jets with undivided power agitate, and unpack the media bed. The cyclonic cleaning action starts at the bottom of the filter and flows upward to the top where the dirt water is flushed out to the waste line. The pressure equalizer column provides a secondary exit for dirty water to exit the filter. Since Xtreme Bio Media are almost neutral buoyant, they required little energy from the water jets to unpack, stay suspended and rotated within the filter volume allowing dirt and debris to be rapidly flushed out the filter thus reducing the amount of water usage during backwash.

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4. Blower or not: Xtreme BioFilter does not use an air blower during backwash. It uses its own bio media are slight sinking, almost neutral buoyant in water. The media can be easily unpacked with little energy from the undivided power of water jets. Backwash the filter is easy and simple. With a turn of a handle on the multi-port valve is all it takes.

5. Sludge drain: All Xtreme BioFilters are configured such that the incoming water is flown downward. Large amount of dirt and debris are trapped at the top layer and the rest is spread out the entire media bed. Filtered water reaches the diffuser head located at the bottom of the filter and then returned to the pond via multiport valve. There is no sludge to be collected at the bottom of the filter tank, thus there is no sludge drain needed as with most of bead filters. The drain at the bottom of the filter tank is used mostly for winterization. When the system is shut down for the winter, the multiport valve is set on Winterize position and the drain cap is left off. Water drips out slowly and will drain the entire filter tank which prevents the water from freezing inside the filter.

6. Buried or not: Top mount filters have an advantage over side mount filters is that they can be buried up to the neck for space savings and anesthetic reasons.

7. Cost: Xtreme BioFilters are priced competitively as compared to other bead or other filters on the market. The performance, ease of use and maintain have set Xtreme BioFilters apart from other filtration systems.

Q: I have an existing pond; do I need to add any beneficial bacteria to kick start the newly installed Xtreme Bio Filter?

A: If your have an existing and established pond. Do not change the pond water for at least 3 weeks. The bacteria are already in the water, you do not need to add any beneficial bacteria. The bacteria will need time to attach to the new media surface and grow to a level that needed to adequately remove ammonia and nitrite. Feed your fish sparingly. Check the ammonia and nitrite level every 3 days for the first 2 weeks.

Q: I have almost 10,000 gallon koi pond. My water is always not clear. It seems there are small particles in the water. I am using a bubble bead filter casing and K1 Kaldness media. I am not happy with it. Can your filter produce clear water? Do I need any other equipment for pre filter?

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A: The K1 Kaldness media are much larger media (1/2 inch diameter, 1/2 inch length) than ours (1/4 inch diameter, 3/8 inch length). That is why the water is not clear. They are not trapping finer particles.

Original Bubble beads without a blower for backwash does not break up the media packing to allow a thorough cleaning. Old dirt is still in the system, new dirt creates a tighter packing and eventually it has channeling problem. Dirty water will by-pass the media packing, via channeling along the side walls of the filter and return to the pond. Water passed through without any filtering that is why your water is always cloudy.

Our Xtreme Bio Filters eliminate these problems. Smaller media, tighter packing will filter smaller particles, down to 30-50 microns. When backwashed the media bed is unpacked with our patented diffuser assembly. It provides a thorough cleaning with a cyclonic cleaning action, and no packing of the media bed at the top of the filter. No channeling. No beneficial bacterial loss during backwash which eliminates ammonia spike after backwash. Cleaning is required less than 5 minutes, once a month for most ponds.