



Waterco Case Study

Maryland Zoo

Biodiverse Marsh Aviary exhibit Maryland Zoo in Baltimore (USA)

A combination of Waterco Glass Pearls, MultiCyclone filtration and SM1050 filters create a healthy ecosystem for native bird species.

“ *Waterco’s filtration solutions have not only reduced labor and material costs, along with exhibit downtime, but also reduced the time it previously took zoo technicians to replace the filter media every few months.* ”

*says Kyle D. Leister,
Maryland Zoo’s water quality
tech-operator*

- Glass pearls solve challenge of impaction problem caused by sand filter media
- Filtration solution reduces staff and material costs, and exhibit downtime
- 20% Less backwashing results in significant water and power savings

Setting: A biodiverse wetland teeming with life

Opened in 1876, the Maryland Zoo in Baltimore is the third oldest zoo in the United States. The historic 135-acre site, which is located in historic Druid Hill Park, is home to over 2,000 animals with the largest area dedicated to species originating from the African continent.



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The zoo's 12,000-gallon marshland aviary exhibit imitates a typical wooded freshwater marsh found on the upper eastern shore of Maryland, where numerous rivers flow into Chesapeake Bay. A type of wetland dominated by grasses, marshes are transition zones between dry land and open water. As such, they are critical to the survival of many species of resident and migratory birds, fish, reptiles, amphibians, and invertebrates.

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Challenge: High-maintenance sand filtration impaction

Zoo technicians were plagued with ongoing issues involved with impaction of the existing sand filter. A combination of algae, dissolved waterfowl diet and bacterial film had resulted in the sand in the sand filters loading up rapidly and

clumping together, significantly blocking flow several times over an 18-month period.



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"Because of the gelatinous nature of the biomaterial, the sand would clump into large bricks that could not be broken up during backwashing," explains Waterco's Marketing Manager and Life Support Development, Kristina Macias. "Therefore, the sand had to be removed and replaced in a matter of a few months. This negatively impacted exhibit appearance, water quality, and the overall functionality of the Life Support System."



Waterco's Glass Pearls are manufactured from 100% pure virgin glass and prove an extremely narrow particle size range, enabling the creation of a dense homogeneous filter media bed.



The MultiCyclone 70XL works on the basis of centrifugal water filtration, and there are no moving parts to wear and tear, and no filter media to clean or replace.



Waterco's Micron Commercial Fibreglass Filters are made from continuous strands of high quality fibreglass filament wound under controlled tension to create a seamless, impervious vessel.

Solution: Centrifugal water filtration combined with Glass Pearl purity

Joey Stokes, an engineer/technical support manager for Waterco, suggested Glass Pearl media in place of sand to reduce impaction of the filter media. Manufactured from 100% pure glass, Waterco Glass Pearls offer much finer filtration than conventional filter media. Whereas other filter media may contain a variety of contaminants, glass pearls are chemically inert for superior purity. They also require up to 20% less backwash water than sand, saving operators valuable time and water.

Operating on the basis of 'depth filtration', dirt is driven into the filter bed and trapped in minute spaces between the particles of filter media, allowing clean water to pass through.

Based on centrifugal filtration, incoming water is guided by a diverter plate so that it enters 70 hydro cyclones that spin the sediment out to the hydro cyclone's wall. It then spirals it down to the sediment chamber, while the clean water spirals upwards and out. Subsequently, there is no filter media to clean or replace and no moving parts that cause wear and tear.

Conclusion: Finer filtration, less labor, reduced downtime

Waterco's filtration solutions have not only reduced labor and material costs, along with exhibit downtime, but also reduced the time it previously took zoo technicians to replace the filter media every few months.

"We have been running the Glass Pearl media for four months," says Maryland Zoo's water quality tech-operator, Kyle D. Leister. "Thus far, we have only good things to say about the new media."

The biggest improvement, Kyle explains, is that the biomaterial trapped in the filters – or 'sludge' as he refers to it – is now easily removed with a short backwash of municipal water.

"Previously, we used quartz silica sand and the sludge would become embedded in the media, making proper backwashes impossible," Kyle says. "Every few weeks we used to have to open the filters, chlorinate overnight, then use a cement mixing paddle on a drill to break up the media prior to backwashing. In eighteen months, new sand had to be replaced twice before we decided to take the plunge and switch to glass pearls."

Furthermore, with normal 0.8mm sand filter media, a 10-minute backwash with the same flows and pressures would drop the pressure from 30+psi to around 15psi, which wouldn't last long. However, with Waterco Glass Pearls, zoo technicians can achieve pre-load pressures <10psi after only a three-minute backwash from 30+psi – even when they were running the system only using one filter.

Waterco Glass Pearls have been evaluated by TUV SUD PSB and are suitable for domestic swimming pools, aquaculture, water treatment and industrial applications. TUV test reports can be made available upon request.

*All sizes of MultiCyclones have been certified by NSF/ANSI to the NSF50 standard.