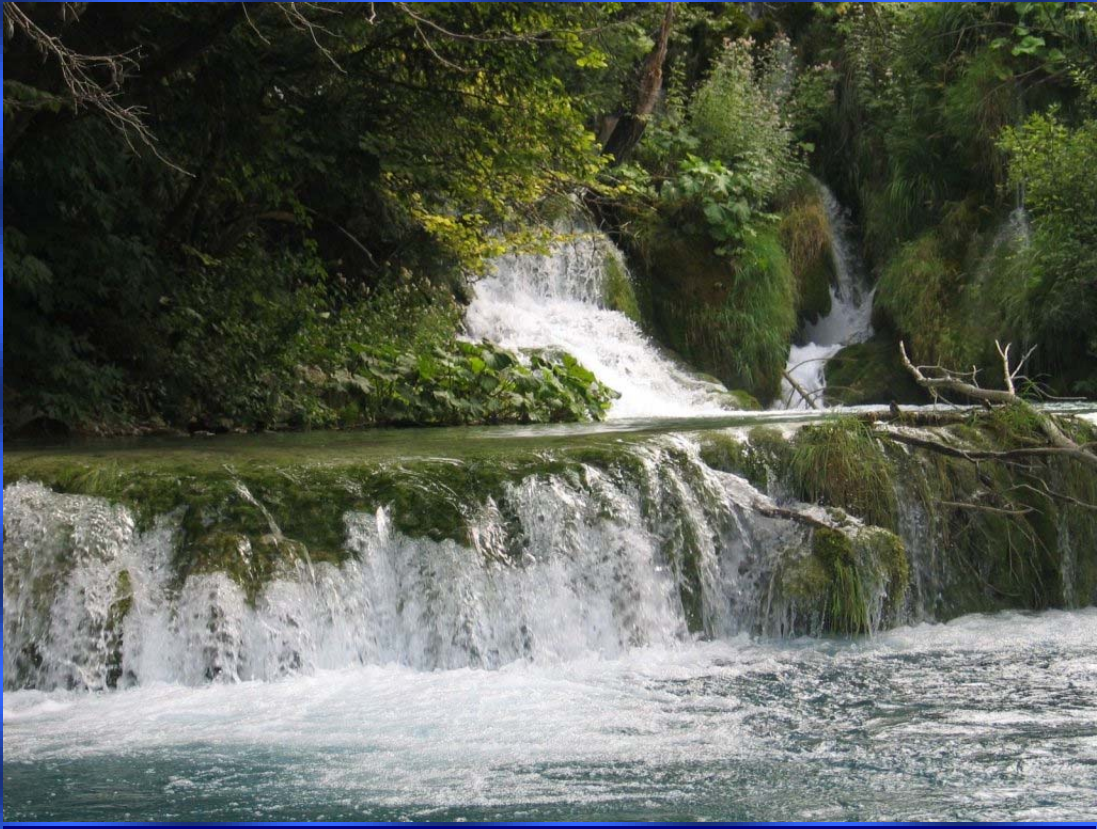


AquaBio Complete

Water Restoration Systems
"A Natural Water Restoration Process"



PROPAK AquaBio Complete Water Restoration Systems

Conserving natural resources and lowering operating expenses is no longer an option, it is a necessity. Water, sewer and discharge fees are continuing to increase, forcing carwashes to conserve and recycle to reduce expenses and increase profits. Our biological water restoration systems allow the reuse of the most common denominator in vehicle washes - WATER.

The Technology

PROPAK AquaBio Complete Water Restoration Systems are based on principles that have been used on biodegradable pollutants in municipal sewer treatment systems for decades. While the pollution in carwash wastewater is not sewer water, similar techniques are used to achieve the same clean water goal. Biodegradable pollutants are transformed into Carbon Dioxide (CO₂) and water (H₂O). Non-biodegradable pollutants are removed using different treatment processes. PROPAK systems are designed to use a combination of all these proven technologies.

Water Restoration Process Steps

Sedimentation - Water coming from the carwash with all combined pollution (biodegradable and non-biodegradable) enters into collection tanks (sand/oil interceptors) where particles heavier than water will be separated by gravity and collect at the bottom of the tanks for periodic removal. The water then exits to the aeration chamber.

Aeration Chamber – Upon entering the tank, the waste water will be infused with oxygen (Fig. 1). This begins the process of converting anaerobic bacteria into aerobic bacteria. This step emulsifies the chemicals contained in the waste water and prevents odor. This water is then pumped to the cyclones (Fig. 2) using properly sized vortex pumps.

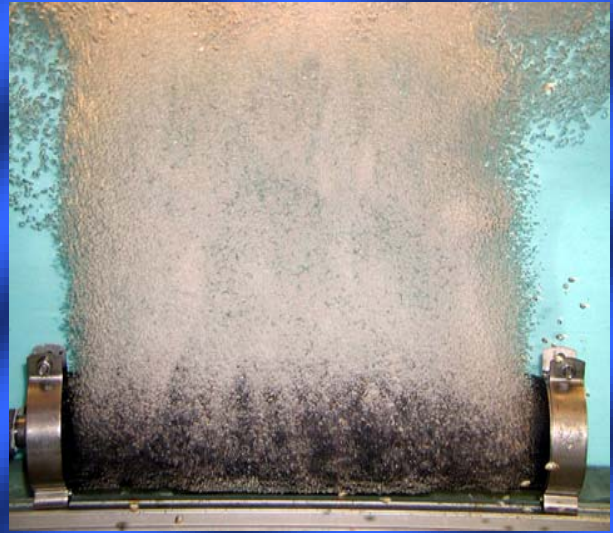


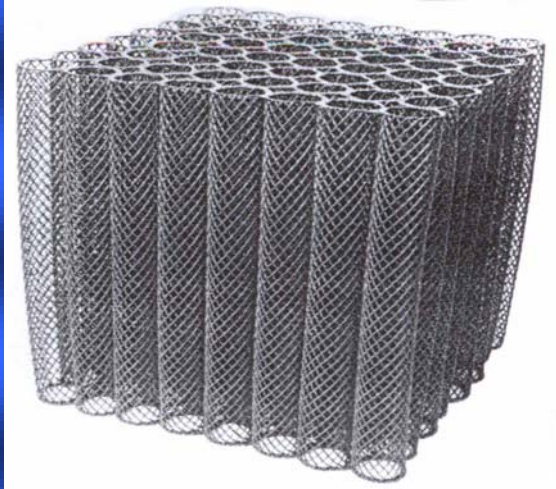
Figure 1 – Aeration



Figure 2 – Hydrocyclones

Cyclone Separation – The water from the vortex pumps is put through the hydro cyclones. This process removes any remaining solids down to 5 microns or less. The solids separated are returned to the first stage of the collection tanks. The cleaned water is then sent to the bio chamber.

Biological Process – In the bio chamber, the separated water from the hydro cyclones begin the natural process of removing the wash water chemicals. The aerobic bacteria attach to the bio block media (Fig. 3) and their growth is accelerated with the added aeration which is infused into the waste water



Bio Block (Fig 3)

from the bottom of the chamber. The active growth bacteria then consume the chemicals contained in the wash water resulting in CO₂ and H₂O. The bacteria also forms on the small particles (less than 5 microns) that were not filtered out by the hydro cyclones forming clusters (sludge).

Clarifier / Plate Separation – This chamber functions as the final “polishing” prior to re-using the wash water. In this chamber, the bio clusters (sludge) accumulate and are removed regularly during system operation.

Clean Water Storage – After the clarifier, the water is gravity fed into the clean water chamber. When the wash is operating, the system is in constant recirculation. When the wash is not washing any vehicles or closed, the system then goes into the energy saving mode. This mode turns off the vortex pump(s) and turns on the recirculation system which allows the system to remain aerobic, “polish” the water, reduce energy costs and save wear and tear on system

components. The water is now ready to reuse in the wash. The processed water may have a slight color depending on the chemicals used

in the wash process. These dyes are also bio degradable but require additional time and recirculation. The color will vary depending on wash volume but will not affect the use of this processed water.

Water Quality

Biologically restored water will be clear and look very good but may not be free from salts or hardness that has come from mains water, chemicals, or road salts. These non-biodegradable pollutants must be controlled and flushed if levels get too high. This can be accomplished automatically with our water quality monitoring management option.

Working with “natural” treatment systems requires a common sense approach to chemical usage. Overdosing car wash

chemicals or the use of dangerous chemicals (e.g., Hydro Fluoric Acid) in the carwash operation will negatively impact the treatment systems performance.

Expected Water Quality Results

- Oxygen Level – greater than 60%
- Oil Emulsion – less than 5 ppm
- PH Levels – 6.0 to 8.0
- COD Reduction to 1:10
- BOD levels less than 150 mg/l
- Particle Size – 5 Microns or less

(The water produced is processed water and is not approved as a potable source.)

Installations

PROPAK AquaBio systems can be installed underground or above ground in equipment rooms as illustrated below.



Underground Installation



Above ground Installation

Underground Installation

In underground installations, only the controls, aeration blowers and hydro cyclones are installed in the equipment room. This saves valuable space for other carwash equipment or reduces building size saving construction costs. The balance of the system is pre-engineered and pre-assembled at the *PROPAK* factory to ease installation under the carwash building, drives or unimproved land.

The underground treatment system should be carefully sized based on projected future carwash volumes. The bio reactor in the underground system is permanently sized and cannot be upgraded to meet higher capacities at a later time.

Above Ground Installation

Above ground treatment systems have the bio reactor and the separation tank (available in Stainless Steel or Aluminum) combined into one compact tank assembly. These systems utilize the sand / oil interceptors in use at the wash for the necessary sedimentation of heavy solids. The waste water is aerated in the last stage of the interceptor and pumped into the bio treatment system located in the equipment room. These systems also require a clean water storage tank.

An advantage of above ground systems is the possibility to connect several tanks together to increase the water treatment capacity. Pollution calculations for each wash will determine how many tanks will be required to treat the waste water. Installation is also possible outside the building, but only if frost free conditions are assured.

System Capacity

Both systems are available in varying capacities. Consult with your distributor for the appropriate system sizing.

Standard System Sizes

Underground - 4,000 -6,000 -10,000 and 20,000 GPH (15,000 – 75,000 LPH)

Above ground – 1,200 -2,400 -3,600 - 4,800 and 6,000 GPH (4,500 – 22,500 LPH)

Sizing Your System

While our model numbers refer to the gallons per hour the systems is capable of processing, the system is more accurately sized based on the hydraulic / chemical load on the bio chamber. To properly size a system, the following information is required:

- Gallons per vehicle wash
- Vehicles per hour
- Chemicals used
- Amount of chemical used per vehicle

As in nature, there are some chemicals that are harmful to a biological system. Contact your *PROPAK* water treatment specialist for proper sizing.

Maintenance Requirements

The Propak AquaBio Complete water restoration system requires less than one hour of maintenance per week. Visual monitoring, periodic inspection of the aeration blower filter and the regular addition of bio nutrients will keep your system operating at its best.

To ensure a trouble free system an increased monitoring of accumulated sediment is required. Keeping the separating tanks (pits) cleaned will result in longer and cost effective operation.

System Options

Touch Screen Control Panel – all the operating information at your fingertips. Displays system status, history, and allows for programming changes and enhancements.

Repressurization System – A VFD controlled stainless steel submersible pump complete with flow sleeve housing and low level protection.

Automatic Freshwater Changeover – automatically switches to fresh water in the event of a system fault. This will automatically send an alert email to you

Automatic Freshwater Make-up – automatically adds fresh water to the system when carry off and evaporation exceed normal intake volumes. Also available with flow meter to monitor the volume of added make up water.

Water Quality Monitor – with this option, your water is constantly monitored to designed levels resulting in consistent quality.

Maintenance Programs – there are several cost effective options to keep your system operating as designed. From our scheduled shipment of bio nutrients and air filters to quarterly onsite evaluations. We will work with you to determine which program will best suit your needs. Our goal is to have your system continually operating at peak performance and help prevent costly downtime.

Your Installation

PROPAK AquaBio Water Restoration Systems are available worldwide and your local vehicle wash equipment distributor can assist you with sizing your wash application



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