Hydro Biodigesters

Remove biodegradable substances and odors from wastewater.

Biodigesters are produced with naturally occurring bacteria (over 450 billion active bacterial cells per liquid gallon or 2.7 trillion cells per pound of dry product), lab grade purified enzymes, micro and macro nutrients. Biodigesters shelf life is guaranteed for one full year.

Biodigester enzymes target undesired biodegradable substances (substrate), and break it down into fats and simple sugars that can be digested by the bacteria. For example, the long chain hydrocarbons that make up fuel and lubricating oils are first broken down into fats by one enzyme and then into simple sugars by another. The sugar is subsequently consumed by the Hydro Biodigesters bacteria which produce small amounts of heat, enzymes, water and CO2.

Biodigester enzymes work quickly, creating up to 30 million chemical reactions per second. Because Hydro Biodigester cell count can double every 15-20 minutes while simultaneously producing enzymes, biodegradable material is quickly digested. Odor causing bacteria are overwhelmed and consumed by the Biodigesters through a process called step degradation.

Compounding Biodigesters

Hydro Biodigesters contain facultative bacteria strains that can operate in either aerobic (with oxygen) or anaerobic (oxygen depleted) environments. Bacteria strains are selected to target wastewater contaminates. After the correct bacteria have been selected, they are propagated, flash frozen and dried.

Select lab grade purified enzymes that generally react with the substrates found in wastewater are added to the compound. These enzymes begin reacting to degrade the substrate immediately upon introduction into the waste stream.

Finally, to ensure that the bacteria begin metabolizing food, creating enzymes and reproducing immediately upon activation, key micro and macro nutrients are added to ensure an optimal initial food supply. The nutrients supply a well-rounded diet while the enzymes start breaking down the substrate. Soon after the bacteria produce enzymes that are adapted to target the waste stream substrate.

Application and Use

Prior to application, wastewater systems with odor problems should be disinfected. Standard household bleach can be used at a rate of 1 gallon per 500 gallons of wastewater. Wait 48 hours for the chlorine to dissipate by off-gassing before introducing the Biodigesters.

Dry Formula Biodigesters

Use one 16-ounce container for each 1000 gallons of water to be treated. To activate the biodigesters, mix the 16-ounce package with two gallons of warm water (90°F, 32°C), and allow the mixture to sit for an hour. Then introduce the solution into all water holding bodies within the system being treated.

Liquid Formula Biodigesters

For initial treatment, use one gallon for each 500 gallons of water to be treated. For regular maintenance, use a total of 3-ounces per 500 gallons system wastewater capacity daily. Since small, regularly recurring doses are preferable to a single daily dose, we recommend that you use the Hydro PN: 3CO942 Automatic Dosing System to program small doses.

Notes:

- Higher dose rates may be required in open discharge systems with high trough put rates.
- If consistently dosed, Hydro Biodigesters will remain active in the system.
- Over time, the effectiveness of bacteria will degrade. Each successive generation of cells becomes less effective than the last, making the introduction of new Biodigester cultures crucial to effective ongoing system management.

Expectations

- In 2-4 days, there will be a reduction in nitrogen, phosphorus, organics and oil levels.
- In 3-4 days, there will be a reduction in odors.
- In two weeks, organics, dissolved solids and hydrocarbons will reduce markedly. There should be a visible improvement in water clarity and quality.
- In one month, a noticeable reduction in the accumulation of organic tank bottom sludge will be found.

Optimal Conditions for Biodigesters

- Dissolved oxygen: levels of at least 3ppm are recommended. An aeration system is required to fulfill this requirement.
- pH level: a range of 5.5 to 9.5 is allowable. Optimum growth rates will occur from 6.6 to 7.4.
- Temperatures between 70 and 95°F provide the optimum conditions for growth. Sustained temperatures above 150°F will cause cell death and below 45°F cell growth will slow and stop but this will not kill the bacteria.

- Nitrogen: Hydro Biodigesters require at least 5ppm nitrogen. Reproduction rates will be shortened at more than 20ppm nitrogen.
- Salinity: Hydro Biodigesters are effective in both marine and freshwater environments.
- Toxic shock: Hydro Biodigesters are resistant to toxic chemical shock including sudden influxes of petroleum hydrocarbons, chlorinated compounds, cyanides, and heavy metals.

NOTE: When bactericidal chemicals are present in the wastewater, contact Hydro Engineering for consultation before treatment.

Exclusive Benefits of Biodigesters

Biodigesters don't just reduce contaminates; they break down and consume them. Media filter change outs are reduced, coalescing plates, pipes and valves are kept clean. Biodigesters propagate through the bottom solids in sumps and tanks, consuming organic materials like plant sludge, oil and grease. In many cases the sludge digestion process produces non-hazardous waste which eliminates waste hauling fees.

Hydro Biodigesters digest long chain hydrocarbons, light fuels, sludge, grease, and any biodegradable organic matter. The result is a significant reduction of BOD/COD and TSS. The byproducts produced from this biological transformation are harmless and "stink" free. Only carbon dioxide and water remain.

Proven Applications

- Rendering plants and waste lagoons - treat waste streams to control all types of organic wastes while substantially reducing odors.
- Aquaculture - treat in place to consume organics, nitrates, reduce bottom solids, reduce algae, and to control nitrogen and phosphorus, without harming fish or aquatic plants.
- Surface cleaning - washing surfaces with recycled wastewater that contains Biodigesters digests the oil and grease left on the surfaces by prior wash operations. This is particularly true on porous surfaces such as concrete that retain water.
- In situ remediation - treat by flooding or injection to break down organics. An excellent treatment for animal stalls and paddocks to eliminate odors and restore drainage through organically impacted soil.
- Contaminate removal in; grease traps, oil/water separators, septic tanks, oil coalescing systems, oil and fuel spills, lift stations, trenches, pipes, settling tanks, waste-holding tanks, cartridge filters and sumps.

Contact the experts at Hydro Engineering with questions about your applications.