



BIO-ACT™

An Innovative Bacteriological Process Tool for Waste Water Treatment

BIO-ACT

BIO-ACT is a carefully selected, precisely balanced blend of several bacterial strains.

Key Characteristics Include:

- Strict and facultative properties able to thrive under anaerobic and aerobic conditions of up to 2ppm dissolved oxygen
- Live liquid form
- Capability of photo-lithotropic and photo-organotropic metabolism under anaerobic conditions
- Fixation of molecular nitrogen
- Motile via polar flagella
- Some members exhibit excellent growth at low (4°C) temperatures
- Growth over pH levels of 6.0 – 9.0
- Growth possible utilising sulphide as the sole electron donor
- Capability of oxidative metabolism without light under microaerophilic conditions
- Will utilise organic substances in the absence of hydrogen sulphide

N.B. References on individual applications are available, whilst other industrial wastes can be laboratory tested for suitability of treatment with BIO-ACT. BIO-ACT is non-toxic and non-pathogenic. It is harmless to aquatic life and compatible with other desirable bacteria in waste water. The product is authorised by the U.S. Department of Agriculture for applications within Federally Inspected meat, poultry and egg processing plants.

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Due to its continuous policy of research and development, the Company may alter product specifications without prior notification.

Effective Hydrogen Sulphide Control, Removal of Grease Accumulations and Overall Improved Treatment Performance

The decomposition of various types of domestic and industrial wastes is a complex biological process, which requires countless bacterial actions and interactions over time to be achieved. The bacteria normally present in a waste water treatment system can, in a very real sense, become their own worst enemies.

Many waste water treatment plants experience problems when anaerobic conditions in tanks, ponds and lagoons cause the generation of hydrogen sulphide gas. Microbes responsible for the breakdown of organic substrates in anaerobic conditions convert sulphur containing compounds into sulphide.

The sulphur cycle is a critical step in the decomposition of waste as well as absolutely necessary to the survival of the organisms themselves. Unfortunately, hydrogen sulphide is released as an intermediate by product of their normal metabolism. Most naturally occurring bacteria not only cannot utilise hydrogen sulphide, but it is also toxic to them. Even low levels of hydrogen sulphide (5ppm) can substantially reduce biological activity. The result of this is a poorly performing biomass creating odorous hydrogen sulphide, higher than normal.

BIO-ACT can be used Commercially in the following Waste Water Treatment Applications:

- Domestic Sewage Treatment
- Sugar Beet Processing Waste
- Dairy Products Production Waste
- Food Processing Waste
- Rendering Waste
- Slaughter House and Animal by-Product Waste
- Pulp and Paper Process Water

How Bio-Act Works and Benefits Waste Water Treatment

Odour Control Healthier Biomass

Odour generation due to sulphide and the accompanying complaints cease to be problematic. The removal of H_2S results in a healthy efficient biomass. The impact of a highly toxic substance such as H_2S varies in specific effect from location to location. However there is no doubt that even low levels can create problems.

Grease

Whilst the most difficult industrial wastes (examples – fats, oils and grease compounds) are eventually degraded by normally present bacteria, some are exceptionally stable and require extended time for breakdown. BIO-ACT contains specific strains, which can readily convert these substrates into more elementary components, (i.e. proteins, fatty acids, glycerols, Carbon dioxide and water).

These simpler compounds are far more readily available to the normally present bacteria resulting in faster, more complete reductions.

BIO-ACT bacteria utilise hydrogen sulphide in their metabolic process. Essentially, the H_2S molecules are converted to elemental sulphur.

The sulphur is then stored by the bacteria within their cell structures for use later should hydrogen sulphide become unavailable. This remarkable process results in dramatic hydrogen sulphide reduction.

By maintaining low hydrogen sulphide levels several benefits result within a waste water treatment system.

Synergism is Central to Efficient Treatment

Odour Control - Improved Treatment

First, toxic hydrogen sulphide is removed from the system. As a result, odours are controlled and the biomass becomes healthier and more efficient.

The healthier biomass results in more complete digestion. As efficiency increases BOD/TSS and fats, oils and grease are reduced assisting in meeting standards for discharges or reducing surcharges.

Lower Operating Costs - Increased Capacity

Increased anaerobic decomposition of organic materials requires less oxygen for the biomass to function, dissolved oxygen (aeration) requirements can be reduced, operating cost for power is then decreased.

The improved overall performance of the system results in less sludge formation, improved settling and the reduction of accumulated sludge. There is less sludge to deal with and, in effect, the system capacity is increased.

Reduced Corrosion & Improved Safety

In addition, due to H_2S removal, corrosion is reduced, safety is improved and the use of chemicals can be reduced.

Hydrogen sulphide reduction and the synergism produced by and between the BIO-ACT strains and the normally present bacteria will also impact the accumulation of organic solids. In simple terms the organic material available for decomposition is more “food” than a “sick” biomass can digest. Leftovers settle and form sludge. The anaerobic conditions that result are made to order for BIO-ACT. Dissolved sulphide levels drop, the biomass is rejuvenated and populations increase at a tremendous rate. As the system is detoxified accumulated sludge becomes a readily available food source and is quickly reduced. The positive changes that result from the use of BIO-ACT are all synergistically related and improvements follow in a domino effect. A typical situation would be: -

BIO-ACT is a biological treatment and therefore requires the correct conditions under which to perform at optimum efficiency. The following adverse condition should be avoided where possible during treatment: -

- Temperatures above 42°C (thermal shock)
- Prolonged water pH below 6.0 or above 9.0
- Lack of proper retention time, usually 6-8 hours
- Waste water containing high levels of heavy metals or other biological toxins

preserving the environment

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