SYNECO BIOTECH
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HOW Persnickety® 713 WORKS

The decomposition of various types of industrial waste is a complex biological process which requires countless bacterial actions and interactions over time to be achieved. The bacteria normally present in a system can, in a very real sense, become their own worst enemies. Microbes responsible for the breakdown of organic substrates in anaerobic conditions convert sulfur compounds into sulfides. The sulfur cycle is a critical step in the decomposition of waste as well as absolutely necessary to the survival of the organisms themselves. Unfortunately, hydrogen sulfide is released as an intermediate by-product of their normal metabolism. Most bacteria not only cannot utilize this substance, it is toxic to them. Even low levels of H_2S can reduce biological activity to near zero.

Persnickity® 713 is a carefully selected, precisely balanced, blend of several bacterial strains. Some of them utilize hydrogen sulfide in their metabolic process. Essentially, the H_2S molecules are reduced to form elemental sulfur. The sulfur is then stored by the bacteria within its cell structure for later use should H_2S become unavailable. This remarkable process results in dramatic H_2S reductions. By maintaining low H_2S levels, odor generation, and the accompanying complaints, cease to be problematic. Secondly, 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 will create problems. Control of H_2S is critical if the effic1ent reduction of organic solids is going to be accomplished.

While even 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. Persnickety 713® contains bacterial strains which can readily convert these substrate 5 into more elementary components (1.e. proteins, fatty acids, glycerols, CO_2, H_2O). These simpler compounds are far more readily available to the normally present bacteria resulting in faster, more complete reductions.

The combination of bacteria to control H_2S and strains with
the ability to solubilize the more stable forms of wastes greatly increases the efficiency of the decomposition process.

H_2S reduction and the synergism produced by and between the Persnickety 713® strains and the normally present bacteria will also impact the accumulation of organic solids. In simplified 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 produce more H_2S and a cycle is put into place that is difficult to break.

Fortunately, these conditions are made to order for Persnickety® 713.

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Dissolved sulfide 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 Persnickety 713® are all synergistically related and improvements follow in a domino effect. A typical situation would be:

A. First, toxic hydrogen sulfide (H_2S) is removed from the system. As a result, odors are controlled and the biomass becomes healthier and more efficient.

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

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

D. 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.

E. In addition, corrosion is reduced, safety is improved and the use of chemicals can be reduced.

