Surfactants

BIO-SYSTEMS INTERNATIONAL

Specifications

Form:	Free-flowing granular powder
Color:	Brown
Nutrient Content:	Biological nutrients & stimulants
Plate Count:	5 billion per gram

Packaging

250 grams water soluble packages protected by a foil overwrap.
10 kilos per plastic pail.

Storage

DO NOT FREEZE! Store in a cool dry location. Do not inhale dusts, avoid excessive skin contact. SEE M.S.D.S.

Application Instructions

Treatment Plants

Flow Rate	Initial Dosage	Maintenance**
Up to 1,000 gpd	½ lbs. per day for 3 days	½ lb. per week
Up to 5,000 gpd	½ lbs. per day for 3 days	1lb. per week
Up to 20,000 gpd	5 lbs.*	1½ lb. per week
Up to 50,000 gpd	8 lbs.*	2 lb. per week
Up to 250,000 gpd	15 lbs.*	¼ lb. per day
Up to 500,000 gpd	25 lbs.*	½ lb. per day
Up to 1 mgd	50 lbs.*	1 lb. per day
Up to 5 mgd	50 lbs. per mgd*	1 lb. per mgd per day
Up to 12 mgd	50 lbs. per mgd*	¾ lb. per mgd per day
Up to 100 mgd	30 lbs. per mgd*	½ lb. per mgd per day

*** Spread this initial dosage out over the course of 10 days.**
**** Add as regularly as possible. If it is required to miss one day, add that day's product with the next dosage.**

Dosage rate will vary with flow rates, retention times and system variations. The rates above are for a typical, well maintained system.

Activated Sludge Systems

Activated Sludge Systems include various process flow sheets for example: Extended Aeration, Contact Stabilization, Step Aeration, Oxygen Activated Sludge. The application rate for all products is based on the average daily flow rate to the aeration basin, excluding the return sludge stream. For seasonal or widely fluctuating flows, contact your BIO-SYSTEMS technical representative.

Trickling Filter and Rotating Biological Contactors

The application rate for all products is based on the average daily flow rate to the filter or contactor, excluding any recirculating process stream. For seasonal or widely fluctuating flows, contact your BIO-SYSTEMS technical representative.

Lagoon Systems

- For aerated lagoon systems, the application rate based on the average flow to the lagoon.
- For facultive lagoon systems, the application rate is based on the lagoon surface area:
  - Day 1 through Day 5 — 20 lbs. per acre per day
  - Day 6+ — 2 lbs. per acre per week
- For anaerobic lagoons, the application rate is based on the total volume of the anaerobic lagoon.
  - <100,000 gallons 1 lb. - 2x per week per 5,000 gal.
  - >100,000 gallons ½ lb. - 1x per day per 5,000 gal.
- For lagoons in cold climates, commence program when the water temperature is a least 50°F

Case History 1010

Chemical Plant

The midwest chemical facility generated 3 mgd of complex wastes containing surfactants. Due to equipment malfunction a release of chemicals to the system resulted in the aeration pH being elevated above 10.0 and formaldehyde levels exceeded 2000 ppm. Within 48 hours of adding BIO-SYSTEMS product the treatment system was at design load.

Case History 1023

Shampoo Production

Routine operation of the local municipal treatment system was disrupted by industrial discharges from shampoo manufacturing. Problems included poor settling, foaming and poor sludge dewatering. The use of BIO-SYSTEMS product in the activated sludge system improved treatment performance, and reduced the frequency and magnitude of upsets.

Surfactants

Your local Distributor is:

1-800-232-BUGS
2 8 4 7
www.BIOBUGS.com

Surfactants

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Product Description

BioBug SF contains a specially formulated range of adapted high performance microorganisms. BioBug SF was developed for use in the biological wastewater treatment of chemical wastes. BioBug SF will degrade complex organic chemicals such as phenols, benzene compounds, surfactants and alcohols. BioBug SF also contains a complete micronutrient blend for microbial growth in all conditions. This is particularly important for industrial waste waters.

In addition to bacteria elements, the presence of a complex of cellulases, hemicellulases, amylases and lipases in BioBug SF provide the capacity to degrade extra cellular polymers (which cause foaming) and surpress the growth of the filamentous organisms by affecting the structure of the filaments.

Effect

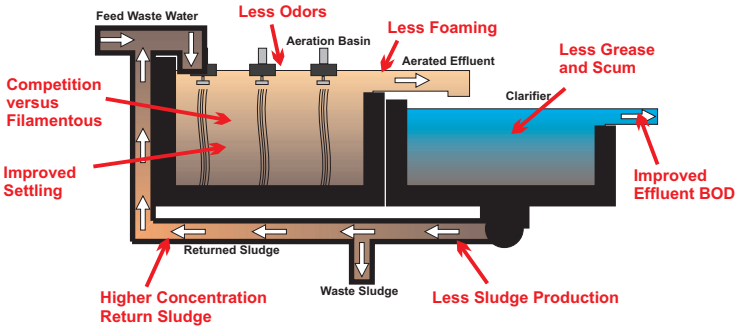
BioBug SF, with its aerobic and facultative anaerobic microorganisms establishes and maintains a biomass which by providing greater resistance to the effects of organic inhibitors present in chemical waste waters, is able to perform more effectively than the naturally occurring biomass. BioBug SF ensures that the natural mechanism for the selection of the biomass population is presented with a range of selected microorganisms. These aerobic and facultative anaerobic bacteria have been taken from their natural environment and then adapted to give optimum performance.

Benefits of BioBug SF:

- Enhances BOD and COD removal while reducing sludge yield.
- Removes chemical deposits and prevent scum formation in holding tanks, sewers, drains and aeration basins.
- Accelerates removal of unpleasant odors associated with handling chemical wastes.
- Prevents the blocking, ponding, and possible collapse of filter bed media.
- Increase the efficiency of overloaded treatment systems.
- Reseed after plant upset.
- Reduces foaming

Bacterial Formulation
Plus
Bio-Enhancer
Plus
Micronutrient

- Enhance organic removal efficiency of biological systems, providing lower effluent BOD, COD, and TSS.
- Enhance solids settling where it has been disturbed by loading fluctuations.



- Accelerate the start-up of new systems and aids recovery after upsets.
- Improve cold weather operation.
- Mitigate effects of dairy related loadings and toxic shocks.
- Reduce sludge production.
- Lower operating costs by reducing chemical consumption.
- Competes against filaments.

1-800-232-BUGS
2847
www.BIOBUGS.com