EcoMicrobials™

EcoFlush

EcoFlush is a balanced formula of selected bacteria strains that combine their diverse activities in a synergistic formula. Its function is to treat food industry wastewater that is high in organic matter, municipal sewage, and septic tanks.

EcoFlush improves the water treatment system effectiveness by controlling operational fluctuations due to peaks of accumulation, as well as mass reductions due to increases in hydraulic charge.

EcoFlush Advantages

EcoFlush breaks down particulate organic matter and absorbs dissolved organic matter reducing the Biological Oxygen Demand (BOD), the Chemical Oxygen Demand (COD) and mud accumulation.

Other benefits include:

- Reduce the proportion of filamentous organisms while favoring the propagation of unicellular organisms.
- Increase protozoa diversity and density.
- Enhance flocculation of activated muds.
- Control bad odors by reducing hydrogen sulfide levels through competitive inhibition of sulfate-reducing microbes.
- Speed up the activation of new systems and increase stability of plant operations with fluctuating influent loading.

Presentation of EcoFlush

EcoFlush can be added directly to the inlet of the tank to be treated, or can be activated and multiplied for 18 to 24 hours before being added to the system. EcoFlush has a load of 300 million viable spores of bacteria per gram and contains an organic chlorine neutralizer, plus a balanced formula of specific nutrients for the multiplication of EcoFlush bacteria.

EcoFlush product incubation

Wash a plastic container with its lid with dishwashing liquid soap, rinse well with water, add potable water and sodium hypochlorite in liquid form until you reach a chlorine concentration of 10 ppm and allow to sit for an hour to disinfect. If an aquarium air pump is available, aerate the water during the disinfection process. The volume of commercial sodium hypochlorite required can be determined according to its initial concentration using the table below.

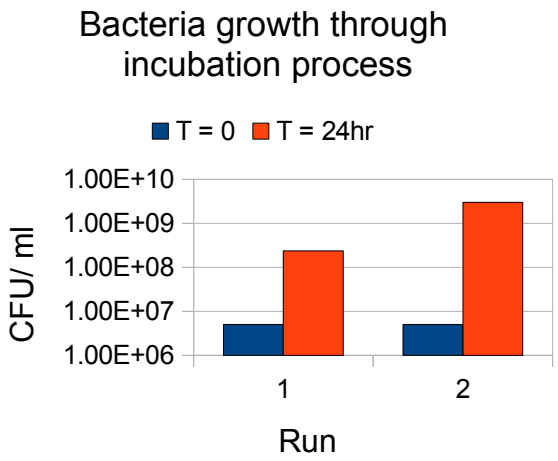
Concentration of commercial sodium hypochlorite	5%	6%	7%	8%
ml of sodium hypochlorite to get 1 liter of water at a 10 ppm chlorine concentration	0.42	0.35	0.3	0.26

After the disinfection process, add 10 grams of EcoFlush per liter of water, mix well, cover with the lid, and incubate the solution for 18 to 24 hours at 20 to 40°C. At the end of the incubation period, the number of bacteria will have increased proportionally according to the temperature and aeration, if possible. With the incubation process you will get at least 500 to 1000 times more probiotic bacteria.

At the end of the incubation period, pour the incubated product into the tank to be treated. EcoFlush microbes perform better within a pH range of 6.0 to 9.0 and temperatures between 20 and 45°C.

Cell Propagation in EcoFlush through activation process

The following chart shows the growth of EcoFlush cells through an incubation process at 25°C during a period of 24 hours. With every 10°C temperature increment there is an increase of 10 fold of the bacteria activity. Changes in environment conditions, such as the amount of oxygen or size of air bubbles modify the results. In the following examples there was an increment in the cell density from $5x10^6$ to $2.37x10^8$ cells per milliliter (47.4 times) in the run #1 in which there was no aeration during the incubation period, and $5x10^6$ to $3x10^9$ cells per milliliter (600 times) in run #2 in which there was aeration during the incubation period.



Dose rates for incubated product

Amount of EcoFlush powder before incubation to be used at different sewage flow rates in a water treatment plant.

Flow	Dose 1st month				Maintenance dose	
m3/day	gr/m3/day			gr/m3/month	gr/m3/day	gr/m3/month
	Days 1 – 2	Days 3 – 7	Days 8 – 30		Days 1 – 30	
< 500	0.5	0.3	0.2	7.1	0.2	6
750	0.42	0.26	0.19	6.51	0.19	5.7
1000	0.38	0.24	0.18	6.1	0.18	5.4
1500	0.35	0.22	0.17	5.71	0.17	5.1
2000	0.32	0.2	0.16	5.32	0.16	4.8
2500	0.3	0.19	0.15	5	0.15	4.5
3000	0.28	0.18	0.14	4.68	0.14	4.2
3500	0.26	0.17	0.13	4.36	0.13	3.9
5000	0.24	0.16	0.12	4.04	0.12	3.6
7500	0.22	0.15	0.11	3.72	0.11	3.3
10000	0.2	0.14	0.1	3.4	0.1	3
15000	0.18	0.13	0.09	3.08	0.09	2.7
20000	0.16	0.12	0.08	2.76	0.08	2.4
30000	0.14	0.11	0.07	2.44	0.07	2.1
40000	0.12	0.1	0.06	2.12	0.06	1.8

Volume of incubated EcoFlush (@ 10 gr. EcoFlush/ liter) to be supplied to different flows rates of sewage in a water treatment plant.

Flow	Dose 1st month				Maintenance dose	
m3/day	ml/m3/day			ml/m3/month	ml/m3/day	ml/m3/month
	Days 1 – 2	Days 3 – 7	Days 8 – 30		Days 1 – 30	
< 500	50	30	20	710	20	600
750	42	26	19	651	19	570
1000	38	24	18	610	18	540
1500	35	22	17	571	17	510
2000	32	20	16	532	16	480
2500	30	19	15	500	15	450
3000	28	18	14	468	14	420
3500	26	17	13	436	13	390
5000	24	16	12	404	12	360
7500	22	15	11	372	11	330
10000	20	14	10	340	10	300
15000	18	13	9	308	9	270
20000	16	12	8	276	8	240
30000	14	11	7	244	7	210
40000	12	10	6	212	6	180

EcoFlush application at different levels of organic load expressed as COD in water treatment systems. Dosage rates are in grams of dry product before incubation and in milliliters of incubated product (@ 10 gr. EcoFlush/ liter) per cubic meter.

COD	Dose 1st month				Maintenance dose	
mg/L	gr/m3/day			gr/m3/month	gr/m3/day	gr/m3/month
	Days 1 – 2	Days 3 – 7	Days 8 – 30		Days 1 – 30	
< 500	0.4	0.2	0.1	4.1	0.1	3
1000	0.5	0.3	0.2	7.1	0.2	6
2000	0.6	0.4	0.3	10.1	0.3	9

COD	Dose 1st month				Maintenance dose	
mg/L	ml/m3/day			ml/m3/month	ml/m3/day	ml/m3/month
	Days 1 – 2	Days 3 – 7	Days 8 – 30		Days 1 – 30	
< 500	40	20	10	410	10	300
1000	50	30	20	710	20	600
2000	60	40	30	1010	30	900

For small waste water treatment systems with a BOD between 100 to 5000 mg oxygen/L we recommend to add between 0.1 to 0.5 grams of EcoFlush/ m3 (10 to 50 ml of brewed EcoFlush/ m3.

For manure degradation and manure smell control add 7 to 10 gr of EcoFlush/ m3 (0.7 to 1 L of brewed EcoFlush/ m3).

Requirements for EcoFlush Performance

- Temperature of 10 to 45°C, with an optimal temperature of 20 to 31°C. Limited performance below 5°C.
- pH range of 6 to 9, optimum activity near pH 7.

Storing Optimal Requirements

Store EcoFlush in a sealed container, in a cool and dry location. After removing needed amount seal container to store. We recommend storing product at a temperature between 1 and 25°C.