

CELLOZYME 5000 – TECHNICAL DATA SHEET

Microbial Ecosystem for the Treatment of Halogenated Organic Chemicals

What is Cellozyme 5000?

Cellozyme 5000 is a unique, salt-tolerant dehydrated microbial ecosystem, dispersible in water, which is capable of biologically decomposing various types of polyhalogenated organic compounds, including halogenated phenols, herbicides, insecticides, dioxin, PCB and similar type compounds, to ecologically acceptable end products which are non-toxic to the environment.

How does Cellozyme 5000 work?

Cellozyme 5000 enzymatically dehydrohalogenates the ring structure of halogenated compounds. This is followed by oxidation of the partially dehydrogenated compounds to low molecular weight fragments which can be readily metabolized by the natural microbial ecosystems already existing in the environment.

Problems with halogenated compounds in the environment

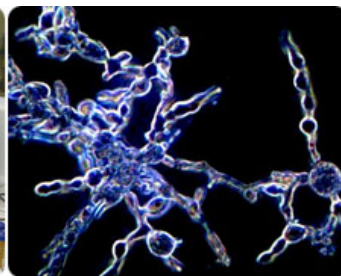
The build-up of certain aliphatic halogenated solvents, halogenated organic compounds, halogenated herbicides, fungicides and insecticides, including pentachlorophenol, 2,4,5-T, aldrin, dieldrin, chlordane, lindane, toxaphene, DDT, dioxin, and PCB has generated legislation at both state and national levels which severely limits or restricts their use.

DDT, for example, is without question one of the most effective insecticides ever developed by chemical synthesis. Unfortunately, its over-all stability, coupled with its resistance to chemical and biological degradation, has resulted in a global build-up of enormous magnitude in both land and water ecosystems. As a result, its use has been banned by governments throughout the world.

How is Cellozyme 5000 applied?

Cellozyme 5000 is supplied in 25-pound and 100-pound polyethylene-lined fiber drums of dehydrated powder.

To activate the microbial ecosystem, add 10 pounds of Cellozyme 5000 and 50 pounds of nutrients to 100 gallons of warm water (100°-120°F). Let stand for one to two hours, with occasional stirring. (continued next page)



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How is Cellozyme 5000 applied?

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Spray the mixture over the contaminated area at a rate of 100 gallons per acre. Being a wholly aerobic reaction, the rate of microbial degradation increases significantly if the soil is first broken up by ploughing or other mechanical means. Soil should be kept moist by spraying with water if necessary. Re-plough the treated area every 72 hours to speed up biodegradation and subsequent removal of halogenated organics.

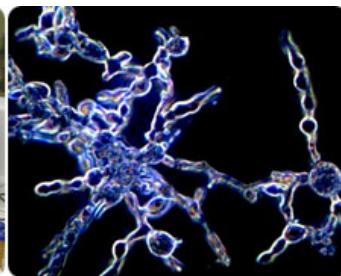
Table 1. Allowable Usage Range

Parameter	Minimum	Optimum	Maximum
pH	4.5	7	9
Dissolved Oxygen (ppm)	2	3	No max
C:N Ratio		10:01	20:01
Temperature (°C)	10	30	40

Soil should also be free of toxic metals, such as hexavalent chromium, and should not contain high concentrations of organic and inorganic wastes and other toxic compounds.

Table 2. Degradation of Aryl Halides by Cellozyme 5000 at 20° C

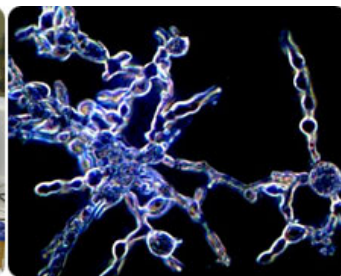
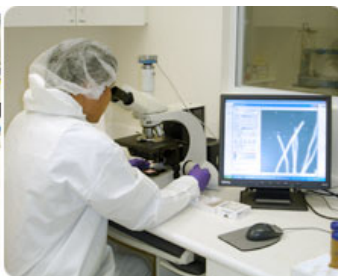
Compound	Concentration (Mg/L)	Ring Disruption (%)	Time (hours)
Monochlorobenzene	200	100	14
o-Dichlorobenzene	200	100	26
m-diDichlorobenzene	200	100	28
p-Dichlorobenzene	200	100	25
1,2,3 Trichlorobenzene	200	100	36
1,2,4 Trichlorobenzene	200	100	36
1,3,5 Trichlorobenzene	200	100	36
1,2,3,4 Tetrachlorobenzene	200	99.8	72
1,2,4,5 Tetrachlorobenzene	200	99.6	72
Hexachlorobenzene	200	99.4	72



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**Table 3.
Degradation of
Halophenols by
Cellozyme 5000 at
20° C**

Compound	Concentration (Mg/L)	Ring Disruption %	Time (hours)
Phenol	200	100	8
0-Chlorophenol	200	100	24
m-chlorophenol	200	100	24
p-chlorophenol	200	100	24
2,4 Dichlorophenol	200	100	36
2,5 Dichlorophenol	200	100	36
2,3,5	200	100	48
Trichlorophenol			
2,4,5	200	100	48
Trichlorophenol			
Pentachlorophenol	200	99.8	72
o-Bromophenol	200	100	12
m-Bromophenol	200	100	12
p-Bromophenol	200	100	12
2,4-Dibromophenol	200	100	24
2,5-Dibromophenol	200	100	24
2,4,6	200	99.5	48
Tribromophenol			
1260 Archlor	200	100	218
Dioxin	200	98	205



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Table 4.
Degradation of
Aliphatic Amines by
Cellozyme 5000 at
20° C

COMPOUND	Concentration (Mg/L)	Ring Disruption %	Time (hours)
Triethylamine	200	100	6
N-Propylamine	200	100	6
Di-N-Propylamine	200	100	12
Tri-N-Propylamine	200	100	12
N-Butylamine	200	100	6
N-Amylamine	200	100	6
N-Hexylamine	200	100	12
N-Dodecylamine	200	100	6
N-Allylamine	200	100	12
Di-N-Allylamine	200	100	12
Tri-N-Allylamine	200	100	24

Table 5.
Degradation of Aryl
Amines by
Cellozyme 5000 at
20° C

Compound	Concentration (Mg/L)	Ring Disruption %	Time (hours)
Aniline	500	100	6
o-Chloroaniline	500	100	6
m-Chloroaniline	500	100	12
p-chloroaniline	500	100	12
2,4,6-Trichloroaniline	500	100	24
o-Toluidine	500	100	6
m-Toluidine	500	100	6
p-Toluidine	500	100	6
o-Anisidine	500	100	12
m-Anisidine	500	100	12
p-Anisidine	500	100	12
o- Dianisidine	500	100	24