

**Onward Manufacture to Application for the effective degradation of solid waste in pit toilets and septic tanks**

Microzyme™ DC20 is designed for the onward manufacture.

In nature, all animal and vegetable matter, from insects to mighty oaks, is broken down and recycled into plant food by enzymes and bacteria. **MCES DC20** uses this same principle to degrade animal and vegetable waste. Like all living things, bacteria must eat to survive. Fortunately, certain types of bacteria will use grease, hair, soap film and all the organic waste for food.

**MCES DC20 is a blend of bacteria and enzymes. The bacteria are natural, not genetically-engineered. The enzyme concentration is the most powerful on the market. MCES DC20 is a proprietary blend of superior aerobic (not less than  $1 \times 10^{10}$ /g) and anaerobic (not less than  $1 \times 10^9$ /g) bacteria selected for their ability to degrade organic waste.**

**PRODUCT CHARACTERISTICS**

- DC20 is a standardized blend of non-harmful non-GMO bacteria and nutrient salts to the following specification:-
- Bacillus Subtilus consortium,
- Bacillus subtilis strain D014
  
- **Bacteria Counts** : Aerobic bacteria not less than  $1 \times 10^{10}$ /g
- **Heavy Metals** : Less than 50ppm
- **Aflatoxins** : Absent
- **Antibiotic Activity** : Absent
- **E. Coli** : Absent in 01.g
- **Appearance** : Tan, low dusting powder on a cereal/salt base
- **Packaging** : 100 gram sachets, 25kg bags
- **Solubility** : >80% in H<sub>2</sub>O
- **pH** : 5,0 – 8,5
- *Effluent with a pH outside this range should be pre-treated with a suitable acid or lime prior to dosing with **MCES DC20***
- **Temperature** : Up to 50°C

**Safety:**

**MCES DC20** is non-toxic. It creates no heat, no fumes, no boiling. It does not attack live tissue or inorganic materials, only organic wastes like grease, hair, food particles, paper, cotton and sewage. This makes **MCES DC20** safe for people, plumbing and the environment. **MCES DC20** changes the waste particles into water, carbon dioxide and mineral ash which run harmlessly out of your waste system. These elements are then available for plant life.

**Effectiveness:**

Within minutes after pouring the bacteria into the affected area, the bacteria begin to eat their way into the waste that has accumulated. This is their natural food. They digest the waste and spread throughout your system, cleaning it completely.

**Economical:**

- Eliminates the need to clean grease traps and cable drains
- Eliminates the need to buy dangerous chemicals
- Eliminates the need to buy deodorant blocks (urinals)
- Eliminates costly compensation to employees that have been injured by using dangerous chemicals

**Multipurpose application:**

- Residential and commercial applications
- All drain and sewer pipes, including:
  - Bath tubs
  - Cat Litter Boxes
  - Floor drains

- Garbage disposal odours
- Grease traps
- Kitchen sinks
- Laundry drains
- Lavatories
- Lift Stations
- Outdoor outhouses and cesspools
- Pit toilets (long-drops) or (poof-doofs)
- RV & boat holding tanks
- Septic tanks and drain fields
- Sewage ejector sumps
- Shower drains

**Dosage:**

The following dosages are merely a guideline.

**1. INDUSTRIAL & COMMERCIAL**

Area	Initial Dose Rate	Regular Maintenance Rate
Septic Tanks (Pit Toilets/Grease Traps)	100g per week	100g per month
Industrial Effluent (e.g. abattoir)	1% for 3 days (w/w)	0,3% per day (w/w)
Agricultural Waste	4% once off (w/w)	1% weekly (w/w)

**2. SEWAGE PLANT**

Area	Initial Dose Rate	Regular Maintenance Rate
Trickling Filter	0,1% once off (w/w)	0,05% weekly (w/w)
Anaerobic Digester	1% for 3 days (w/w)	1% weekly (w/w)
Oxidation Pond	1% for 3 days (w/w)	1% weekly (w/w)
Activated Sludge	1% for 3 days (w/w)	1% weekly (w/w)

**How to use *MCES DC20*:**

Bio-Enzymes act like short order cooks. They prepare food for bacteria by breaking large molecules down into a size the bacteria can "eat." Each works on one specific type of molecule. For example, the protease enzyme only works on protein. Lipase works only on fats. The bacteria in *MCES DC20* are dormant while in the container. When exposed to or mixed with water they come to life in few minutes. In the meantime, the enzymes are breaking down the waste. They act very fast. In fact, they work on contact. When the bacteria revive they are hungry. Each one eats its weight of waste every minute - and they never sleep! As a result of eating and growing they start to multiply through cell division. Their numbers will double rapidly under favorable conditions.

In the treatment of drains, for example *MCES DC20* should be mixed with warm (not hot) water and applied when no water will be drained for six to eight hours. This allows some of the bacteria time to embed them into the waste so they won't be washed out when water is drained again.

Periodic maintenance treatment prevents new organic waste build-up, so no more slow drains or clogs!

Application	Explanation
Septic Systems	<ul style="list-style-type: none"> <li>• Most septic systems in operation do not function well. The tanks need pumping frequently because of solids build up. All too often the fields stop absorbing water prematurely. The number one reason is the vast array of household chemicals which either inhibit or kill biological action. The coliform bacteria normally present in sewage are in no way equal to present daily demands. They are used to warm body temperatures and are poor enzyme producers. They cannot handle synthetic materials present in detergents even under the best conditions.</li> <li>• <i>MCES DC20</i> contains not only potent enzymes, but also bacteria that outperform the coliform species in very important ways. They are high producers of enzymes and they are acclimated so that they feed on a larger variety of materials in the waste such as fats and grease, vegetable oil, paper, detergents, fabric softeners, aliphatic and aromatic organic compounds as well as synthetic organics.</li> </ul>

	<ul style="list-style-type: none"> <li>Chemicals, bleaches, detergents, food preservatives and bowl cleaners inhibit or kill bacterial action within your septic system. This lets solids accumulate in the tank, some of which flow out and clog the drain field. <b>MCES DC20</b> will restore the necessary bacterial action and make your system work at full efficiency! People on a septic system must select their cleaning products very carefully.</li> <li>Do not use chemical cleaners in conjunction with <b>MCES DC20</b>.</li> </ul>
Garbage Disposal Systems	<ul style="list-style-type: none"> <li>Odours come from waste that sticks to the disposal wall and slowly moulds and rots. It is hurled there by the high-speed rotating blades.</li> <li>By using <b>MCES DC20</b>, the waste will be quickly digested by the live cultures, thus eliminating the odour.</li> </ul>
Grease Traps	<ul style="list-style-type: none"> <li>Cleaning out a grease trap is the worst of jobs in a food service operation. After the horrible odorous muck is removed it still has to be disposed of. Unfortunately, we are running out of landfills to put it in.</li> <li><b>MCES DC20</b> will digest the grease, eliminating the unwanted task, as well as the disposal of the pollutant.</li> <li>The grease trap must be large enough to accomplish two things. The flow of the water through the trap must be 1) slowed and 2) cooled, so that the oils and fats can rise and be retained between the baffles while the water continues on down the sewer.</li> <li>A garbage disposal should never discharge into a grease trap.</li> <li>If these criteria are met, daily treatment of the pot sink will maintain the digestive action.</li> <li>Eliminating the need to pump the trap offers significant cost saving.</li> </ul>
Sumps with Pumps	<ul style="list-style-type: none"> <li>When ground water accumulates in sumps, odours may be noticeable. This is especially true if household or sanitary waste is present.</li> <li><b>MCES DC20</b> eliminates the odour by quickly digesting organic material in the waste water.</li> <li>Pumps will require less energy when the rotor, housing and lines are free of build-up.</li> <li>Lower energy costs and longer pump life are added bonuses.</li> </ul>
Pit Toilets (Long-Drops)	<ul style="list-style-type: none"> <li>Mention a pit-toilet and the first thing that pops to mind is odour, flies and maggots.</li> <li><b>MCES DC20</b> turns the waste into water and carbon dioxide very quickly.</li> <li>This dramatically reduces odour and flies, and without flies there are no maggots.</li> <li>Cleaning and disposal of the pit become easier and it is more pleasant for the user.</li> <li>Filling of the pit toilet is significantly prolonged and percolation into the underground is contaminant free.</li> </ul>
RV and Boat Holding Tanks	<ul style="list-style-type: none"> <li>As the waste water level increases in the tank, some scum adheres to the sides and sensor. When the tank is drained, more scum is deposited. With continued use, this coating becomes odorous. It is additional weight and reduces tank capacity. There is no large access to the tanks, and the build-up is often so great, and clean-up so difficult and time consuming, that replacing the tank is often less expensive.</li> <li>RVers using chemicals in their tank are also encountering the new problem of not being able to dispose of their chemically treated waste at many dump stations. Wastewater treatment plants do not want this chemical toxicity in their plants, so they charge dump stations large fines.</li> <li>If <b>MCES DC20</b> is used from the beginning, a tank will drain cleanly, including the sensor, if there is one.</li> <li>Using <b>MCES DC20</b> in a tank previously treated with chemicals will take larger doses and some time to overcome the toxicity. It will, however, remove the old build-up.</li> <li>Waste from tanks treated with <b>MCES DC20</b> is accepted anywhere because it is biologically active.</li> </ul>

#### Safety:

- MCES DC20** is an environmentally friendly, safe-to-use product that contains a non-GMO strain of Bacillus Subtilis spore and various Enzymes derived from this organism, for example Bacterial A-Amylase and Proteases.

- No product specific certification is provided for, however, the strain for the active ingredients is non –pathogenic and the enzymes are produced by standard fermentation techniques and conform to Generally Recognized as Safe (GRAS) status and have FDA approval for Foodstuff applications.
- The preparation conforms to FAO/WHO and FCC recommended standards.
- In the event of an accidental spillage, wash the affected area with water.

**Storage:**

To maintain maximum activity of the enzymes and the viability of the bacteria, **MCES DC20** should be stored under cool, dry conditions, at temperatures less than 250°C.

**Inactivation of MCES DC20:**

Bacteria / Enzymes present in **MCES DC20** will tolerate temperatures up to 70°C. However, the bacteria in the product cannot tolerate temperatures in excess of 50°C. High concentrations of heavy metals will inhibit the activity of the product. Common cleaning agents containing chlorine (bleaches) and quaternary ammonium compounds (disinfectants) etc. can have a detrimental effect on the product. Neutralisation of these inhibitors is necessary before treatment with **MCES DC20**.

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