

# MICROCAT® DEN

## denitrifying bioformula for wastewatertreatment

Biological wastewater treatment can be effective in nitrification (that is transforming ammonia nitrogen to nitrite and nitrate) but ineffective in removing nitrogen in these oxidized forms.

Under anoxic denitrifying conditions (no molecular oxygen present), facultative bacteria are able to make use of nitrate ion ( $\text{NO}_3^-$ ) and nitrite ion ( $\text{NO}_2^-$ ) to respire. The nitrates are progressively reduced to molecular nitrogen ( $\text{N}_2$ ) which escapes as nitrogen gas to the atmosphere.

Discharge limits are set for nitrate and nitrite for individual wastewater treatment plants for two reasons: 1) high nitrogen content of sewage effluent contributes to eutrophication (algae blooms) in the receiving waters, and 2) high nitrate and/or nitrite concentrations in drinking water can cause illness in young mammals.

**MICROCAT®-DEN** is a synergistic blend of preselected, naturally-occurring micro-organisms for denitrifying (remove nitrate/nitrite from) wastewater under anoxic conditions

### APPLICATIONS:

Under certain treatment conditions nitrate/nitrite ions can build up in effluent water. Under these conditions **MICROCAT®-DEN** can help.

**MICROCAT®-DEN** combines preselected, naturally-occurring microbial strains with denitrifying capability.

**MICROCAT®-DEN** contains a combination of facultative anaerobic microorganisms selected from nature for their ability to use nitrate as an oxygen source. Inoculation with **MICROCAT®-DEN** augments the natural denitrifying microbial populations for enhanced nitrate/nitrite removal capability.

### Conditions Necessary to Induce Denitrification:

1. Presence of denitrifying bacteria
2. Nitrogen available in oxidized forms such as nitrate or nitrite
3. Anoxic conditions (lack of dissolved molecular oxygen)- molecular oxygen inhibits denitrification
4. Presence of a small excess of oxidizable matter (BOD, methanol, settled sludge) to drive the reaction while leaving minimal residual BOD

**MICROCAT®-DEN** can aid in:

1. Improving denitrification rates - greater nitrogen removal- improved low temperature performance
2. More complete BOD removal- facultative organisms work in both aerobic and anoxic zones
3. Removal of some difficult-to-degrade organic components (e.g., amines)

In general, **MICROCAT®-DEN** is applied on a regular basis to the anoxic denitrifying zones of the treatment plant.

#### PRODUCT CHARACTERISTICS:

Appearance	Beige, granular powder
Contents	Preselected, denitrifying microorganisms
Nominal Microbe Count	$> 3 \times 10^9 / \text{g}$
Shelf Life	2 years
Packaging	11.3 Kg plastic pails or 100 Kg fiber drums

#### OPTIMAL APPLICATION CONDITIONS:

	RANGE	OPTIMUM
Dissolved Oxygen (ppm)	0 – 0,5	0
pH	6 – 9	7
Temperature °C	10–40 °C	35°C
Toxic Heavy Metals (ppm)	trace	none

#### STORAGE:

7° – 40° C (45° – 105° F)  
Dry conditions.  
DO NOT FREEZE.

#### CAUTION:

Active enzymes present.  
Avoid inhalation of dry powder or liquid mist.  
Avoid exposing skin to dry powder or strong solution as irritation may result.  
If material contacts skin or eyes flush thoroughly and repeatedly with water.