

#### PRODUCT DESCRIPTION

**Z-BIO ETP-CW** is a blend of selectively adapted bacterial cultures developed to enhance removal efficiencies in wastewater treatment systems operating under low temperature conditions.

Specially formulated bacteria and enzymes in **Z-BIO ETP-CW** have proven effective in improving biological treatment systems.

**Z-BIO ETP-CW** has demonstrated effective degradation of municipal wastes, phenolics, surfactants and other industrial wastes at temperatures as low as 4°C.

Many biological wastewater treatment plants experience a reduction in activity at lower operating temperatures.

Typically this occurs during cold weather months resulting in reduced BOD, COD and specific waste constituent. **Z-BIO ETP-CW** has demonstrated the ability to:

- Degrade emulsifiers, detergents, phenols and hydrocarbons.
- Improve efficiency of BOD and COD reduction at operating temperatures below 13°C.
- Improve NH<sub>3</sub> removal due to improved organic removal.

The rate of chemical and biological reactions slow down as ambient temperature decreases. In a biological system this is exaggerated by the effect colder temperatures have on the transport of nutrients across the cell membrane.

Bacterial cell membranes contain fatty acids which may be saturated or unsaturated.

Saturated fatty acids congeal at higher temperatures than unsaturated fatty acids.

**Z-BIO ETP-CW** exhibits growth and activity at a temperature range of 36° - 90°F (2° - 32°C).

Although **Z-BIO ETP-CW** exhibits maximum growth rates and substrate reduction at higher temperatures it also has the capability of significant growth rates at low temperatures.

Consequently, a system augmented with **Z-BIO ETP-CW** will show improved performance at lower temperatures.

#### HOW ETP-CW WORKS

The rate of chemical and biological reactions slow down as ambient temperature decreases.

In a biological system this is exaggerated by the effect colder temperatures have on the transport of nutrients across the cell membrane.

Bacterial cell membranes contain fatty acids which may be saturated or unsaturated.

Saturated fatty acids congeal at higher temperatures than unsaturated fatty acids.

This can be compared to the differences between shortening, which has mostly saturated fatty acids and vegetable oils, which consist of unsaturated fatty acids that remain fluid at ambient temperatures.

The higher the concentration of fatty acids, the more likely the cell membrane will congeal and become rigid at low temperatures thereby inhibiting the transfer of nutrients across the cell membrane.

The psychrophilic, or cold-loving organisms in **Z-BIO ETP-CW** are theorized to have much higher concentrations of unsaturated fatty acids in the cell membrane.

This allows the membrane to stay more fluid at low temperatures and reduces the impact that low temperatures have on nutrient transport.

Zebec Systems Limited

Alexander Stephen House

91 Holmfauld Road

GLASGOW

Tel: 0141 440 1434 / Fax: 0141 440 1435

## CASE STUDY

A food processing wastewater plant in Pennsylvania was seeded with **Z-BIO ETP-CW** cultures to maintain BOD removal.

Performance was good except during colder months when effluent quality deteriorated.

As temperatures began to decline, the maintenance dosage was changed to cold weather culture **Z-BIO ETP-CW**.

At similar influent loadings effluent BOD was 88% lower from January-March as compared to the same period 12 months earlier.

<b>Effluent Operating Conditions</b>	<b>Winter Without Z-BIO ETP-CW</b>	<b>Winter With Z-BIO ETP-CW</b>
Average BOD	98mg/L	12mg/L
Average TSS	65mg/L	34mg/l
Average MLSS Temp	14°C	11°C
Lowest MLSS Temp	9°C	7°C

## PRODUCT CHARACTERISTICS

### DRY CULTURE

- Total Count 3 billion cfu/gram
- Stability 1 year at 34° - 73°F (1° -23°C)
- Appearance Free-flowing tan powder
- Odor Yeast-like
- Moisture Content 5 - 15%

### Available Packaging

- 10kg Drum
- 25kg Drum

### LIQUID CULTURE

- Total count > 1 x 10<sup>7</sup> cfu/ml
- Stability 6 months at 34° - 73°F (1° - 23°C)
- Appearance Slightly turbid liquid
- Odor Faint to mild musky odor
- Specific gravity 1

### Available Packaging

- 200 Litre Drum

## STORAGE & HANDLING

- Store in a cool, dry place.
- Avoid inhalation. Wash hands thoroughly with warm, soapy water after contact.
- Avoid eye contact.