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## **FIBREZYME™ LWT 400**

Product #933

(Considerations in applications for Wastewater Treatment)

### **I. INTRODUCTION:**

**FIBREZYME™ LWT 400** is a powdered complex of acid cellulase and hemicellulase enzymes that will hydrolyze waste material containing cellulose and hemicellulose (fiber) to soluble lower molecular weight polymers under the proper processing conditions. **FIBREZYME™ LWT 400** is a stable form of hydrolytic enzymes operating between a pH range of 4.5 – 5.5 and temperature of 45°C – 60°C (113°F – 140°F). We recommend an operating temperature of 55°C – 60°C (131°F – 140°F).

### **II. PHYSICAL PROPERTIES:**

Appearance: Tan to cream Powder (Note that color does not affect or reflect activity.)  
Odor: Slight fermentation odor  
pH (as is): 4.5 ± 1.0

### **III. PRODUCT CAPABILITIES:**

When run as directed in this bulletin and with the support of your Dyadic International (USA), Inc. sales/technical representative, **FIBREZYME™ LWT 400:**

1. Transforms particulate COD to soluble COD in wastewaters produced from pulp & paper, grain, fruit, and textile industrial processes.
2. Increases the BOD/COD ratio by increasing waste biodegradability. Soluble lower molecular weight polymers in cellulosic/hemicellulosic wastes are more easily biodegradable than non-soluble material.
3. Reduces sludge volume from a primary clarifier.
4. Increases total BOD and COD removal in biological wastewater treatment systems. As cellulosic/hemicellulosic waste material is solubilized, it is more efficiently digested by aerobic and/or anaerobic bacteria in biological reactors.

Aerobic bacteria lack cellulase/hemicellulase enzymes and are unable to degrade cellulosic fibrous material. **FIBREZYME™ LWT 400** provides the necessary enzymes to hydrolyze long polymers to readily degradable materials in aerobic environments.

When dealing with cellulosic fibrous materials, the rate limiting step in anaerobic reactors is the hydrolysis of the fiber. **FIBREZYME™ LWT 400** speeds-up hydrolysis of the waste material improving the overall treatment efficiency and the gas (methane) production phase.

#### **IV. PROCESSING CONDITIONS: GENERAL**

**FIBREZYME™ LWT 400** will function over a pH range of 4.5 – 5.5, making it adaptable to your process conditions. **FIBREZYME™ LWT 400** will function from 45°C – 60°C (113°F – 140°F). Higher operating temperature results in higher enzymatic activity providing lower enzyme dosage for a particular application. We recommend an operating temperature of 55°C – 60°C (131°F – 140°F).

#### **V. RECOMMENDATIONS FOR USAGE:**

1. **FIBREZYME™ LWT 400** is added at a dose between 10 – 20 grams/ton of COD. The enzyme is dosed at the inlet channel (Parshall flume) normally installed at wastewater treatment systems. The turbulent flow at the Parshall flume will provide the necessary energy to mix the liquid enzyme with the wastewater.
2. **FIBREZYME™ LWT 400** is designed to break down the cellulose fiber and therefore should not be used in the papermaking process. It is recommended that it be used only in the waste treatment system where it is not recycled back to the paper machine unless it is inactivated by one of the methods mentioned in Section VII.
3. It is recommended that lab studies be performed to insure that the secondary treatment systems can handle the additional BOD load resulting from the enzymatic degradation of the cellulose fiber.
4. Optimal enzyme performance can be maintained with controlled process pH between 4.5 and 5.5. We recommend an operating temperature of 55°C – 60°C (131°F – 140°F).

#### **VI. STORAGE CONDITIONS/ACTIVITY:**

**FIBREZYME™ LWT 400** retains more than 90% activity after four months when stored at 25°C (77°F) out of direct sunlight and in the original, closed container. **FIBREZYME™ LWT 400** also has less than a 10% activity loss after 1 month when stored at 38°C (100°F). Do not let freeze.

#### **VII. INACTIVATION:**

**FIBREZYME™ LWT 400** can be inactivated by raising the pH above 11.0 or temperature above 75°C (167°F) or a combination of the two. Oxidizers such as hypochlorite, chlorine dioxide, and peroxide can also effectively inactivate the enzyme.

#### **VIII. PACKAGING:**

**FIBREZYME™ LWT 400** is packaged in 75 kg fiber drums.

#### **IX. TECHNICAL SERVICE:**

Information covering specific applications for this product is available from your Dyadic International (USA), Inc. sales/technical representative. We will work with you to enhance processes and solve problems, in addition to assisting you in achieving the end result desired. Call your sales/technical representative for any questions, comments, or help that you need!

Nothing disclosed is to be construed as a recommendation to use our products in violation of any patents. The information presented is believed to be accurate. However, said information and products are offered without warranty or guarantee, except as to the composition and purity stated herein since the ultimate conditions of use and variability of the materials treated is beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them on a commercial scale. The goods described herein are sold as is and with all faults. The seller specifically disclaims all warranties in connection with the sale of the goods, both express and implied, including, without limitation, the warranties of merchantability and fitness for any particular purpose, as those terms are defined in the uniform commercial code of Florida. The seller shall not be liable for any incidental or consequential damages whatsoever.