



DYADIC INTERNATIONAL (USA), INC.  
140 INTRACOASTAL POINTE DRIVE, SUITE 404  
JUPITER, FLORIDA 33477  
(561) 743-8333 tel.  
(561) 743-8343 fax  
www.dyadic.com

## FibreZyme<sup>®</sup> LBL CONC Product #915

(Considerations in applications for Pulp and Paper Processing: Biorefining – packaging grades and hardwood pulp.)

### I. INTRODUCTION:

**FibreZyme LBL CONC** is a concentrated liquid cellulase/hemicellulase (carbohydrase enzyme) preparation that will selectively modify cellulose and hemicellulose components of virgin and recycled pulps. The product is particularly effective on virgin and recycled furnishes with high xylan contents, such as those used in packaging grades or used to manufacture hardwood pulps (eucalyptus, acacia, oak, gum, maple, etc.), due to their significant xylanase component. **FibreZyme LBL CONC** is a stable cellulase/hemicellulase complex operating within a broad range of pH (6.0 to 8.0) and temperature 25°C to 60°C (77°F to 140°F).

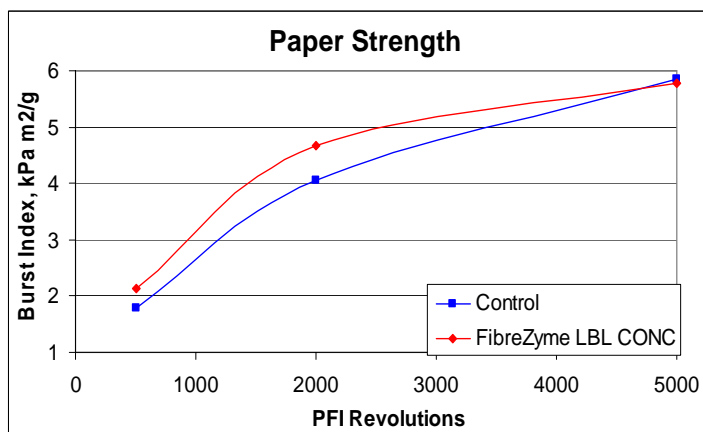
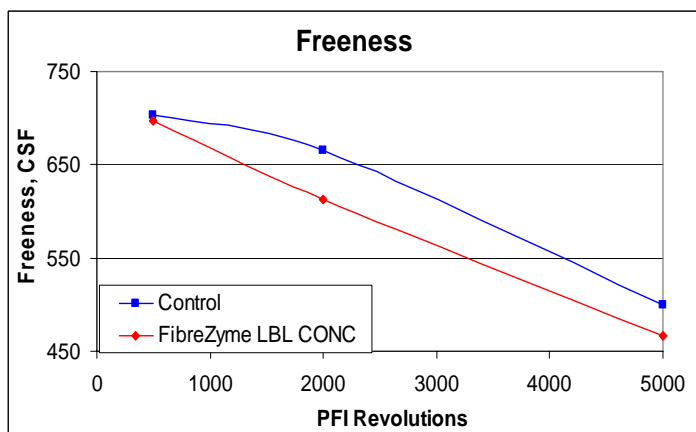
### II. PHYSICAL PROPERTIES:

Appearance: Medium to dark amber liquid (Note that color does not affect or reflect activity.)  
Odor: Slight fermentation odor  
pH (as is):  $4.5 \pm 0.5$   
Density: 1.15-1.25 g/ml

### III. PRODUCT CAPABILITIES:

When run as directed in this bulletin, and with support from your Dyadic International (USA), Inc. sales/technical representative, **FibreZyme LBL CONC** can be utilized to accomplish the following:

1. Enhance strength properties including, but not limited to: compression, tensile, and burst strength
2. Increase paper machine speed and production rates
3. Reduce refining energy requirements
4. Enhance furnish drainage rates
5. Increase inter-fiber bonding strength through fibrillation avoiding fiber breakage
6. Improve paper/board formation and quality
7. Reduce felt/wire washing chemicals
8. Improve wastewater COD/BOD ratio as well as reduce overall wastewater treatment demand
9. Disperse stickies and other contaminants and reduce dirt count/content



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

**FibreZyme LBL CONC** will function within a pH range of 6.0 to 8.0 making the product adaptable to most existing pulping processes, including paper manufacturing processes using AKD and ASA sizing.

**FibreZyme LBL CONC** will function from 25°C to 60°C (77°F to 140°F). Higher operating temperature results in higher enzymatic activity providing lower enzyme dosage for such applications.

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

1. **FibreZyme LBL CONC** is typically added at a dosage between 50 to 200 grams/ton (metric ton) of dry pulp. Dosage will depend on the process temperature, pH and retention times, as well as furnish composition. The enzyme is dosed at the hydra-pulper.
2. **FibreZyme LBL CONC** is formulated to be dosed automatically via a dosage pump.
3. When the plant is operating under normal conditions, the initial effect following enzyme addition is an increased steam requirement in the drying section at the paper machine. This indicates that fines production during refining has increased. Refining energy may then be lowered until the drying section returns to normal steam consumption. The process can then be adjusted to follow the quality parameters of the grade being manufactured in the production run.

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

**FibreZyme LBL CONC** 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 LBL CONC** also retains more than 90% activity after 1 month when stored at 38°C (100°F). Do not allow to freeze.

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

**FibreZyme LBL CONC** can be inactivated by raising pH above 11.0, temperature above 71°C (160°F), or a combination of the two. In the pulp and paper process, **FibreZyme LBL CONC** is inactivated in the dryers at the paper machine. No residual enzymatic activity will be found in the manufactured paper.

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

**FibreZyme LBL CONC** is available in 60kg and 240kg polyethylene drums and 1,200 kg tote bins.

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

Information covering specific applications for this product is available from your Dyadic International, Inc. distributor and/or representative. We will work with you to enhance processes and solve problems, in addition to assisting you in achieving the end result desired. Contact your distributor and/or representative if you have any questions, comments, or require any additional assistance.

*Nothing disclosed is to be construed as a recommendation to use the described product 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 as 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 expressed 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.*