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CeluStar CL

Product # 421

(Considerations in applications for Juice, Brewing, Wine, Starch and other Food Applications)

I. INTRODUCTION:

CeluStar CL is an enriched cellulase preparation that will selectively hydrolyze cellulose and beta glucans to lower molecular weight polymers under the proper processing conditions. **CeluStar CL** is a liquid stable form of cellulase/beta glucanase enzyme operating between a broad range of pH (4.5 to 9.5) and temperature 25°C to 80°C (77°F–175°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 to 1.25 g/ml	
Guaranteed Activity:	Cellulase	5,000 to 7,000 CMCase Units/g
Side Activities (typical):	Beta Glucanase	>2,000 BGU Units/g

III. PRODUCT CAPABILITIES:

When run as directed in this bulletin, **CeluStar CL** can be utilized to accomplish the following:

It hydrolyzes the cellulose and beta glucan fractions in various cellulosic biomass materials. In particular, it improves the juice extraction from fruits when combined with other synergistic enzymes. In combination with other synergistic enzymes, it has been demonstrated that the CeluStar CL helps improve juice extraction from fruit berries such as cranberries and rowan berries. Please contact your Dyadic representative for more information.

Because the characteristics of each biomass material can vary significantly, it is recommended that the enzyme dose and application conditions be optimized in lab studies prior to use.

IV. PROCESSING CONDITIONS: GENERAL

CeluStar CL will function from a pH of 4.5–9.5, making it a product very adaptable to most existing processes.

CeluStar CL will function from 25°C to 80°C (77°F to 175°F). Higher operating temperature results in higher enzymatic activity providing lower enzyme dosage for a particular application.

V. RECOMMENDATIONS FOR USAGE:

1. **CeluStar CL** is added at a dosage between 10 to 150 grams/ton (metric ton) of dry pulp. Basically, the enzymatic treatment is added during the breakdown of the fruit to separate the juice.

2. As there is an inverse relationship between reaction time and enzyme dosage to obtain a maximum effect, the enzyme addition that allows the maximum contact time is desired.

3. The **CeluStar CL** has a broad pH and temperature profiles allowing it to maintain high activity over a pH range of 4.5 to 9 and temperature between 50 and 80^0 Celsius.

VI. STORAGE CONDITIONS/ACTIVITY:

CeluStar CL retains more than 90% activity after four months when stored at 25^oC (77^oF) out of direct sunlight and in the original, closed container. **CeluStar CL** also retains more than 90% activity after 1 month when stored at 38^oC (100^oF). Do not let freeze.

VII. INACTIVATION:

CeluStar CL can be inactivated by raising the pH above 11.0 or temperature above 85^oC (185^oF) or a combination of the two.

VIII. PACKAGING:

CeluStar CL is normally available in 240 kg package sizes.

IX. TECHNICAL SERVICE:

Information covering specific applications for this product is available from your Dyadic International, 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!

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