
Zymase™ MA

Product Information

Description

Zymase™ MA is a concentrated liquid enzyme formulation. The enzyme is fungal 1,4- α -D-glucan-glucosylhydrolase, commonly referred to as *Glucosylamylase* or *Amyloglucosidase*, derived from selected strain of *Aspergillus niger*, produced by controlled fermentation.

Zymase™ MA is an *exo*-amylase that catalyzes the release of successive glucose units from non-reducing ends of dextrin and oligosaccharide chains by hydrolysing both linear (1,4- α -D) and branched (1,6- α -D) glucosidic linkages.

Potential application areas for Zymase™ MA include production of highly attenuated low carbohydrate beers and improved attenuation.

This enzyme is permitted for general use as a processing aid under FSANZ Standard 1.3.3 and E.C. 3.2.1.3.

Typical Characteristics

Activity:	Min. 350 GAU/g
Appearance:	Light brown liquid
pH:	4.0 – 4.5
Grade:	Food grade, Kosher
Specific Gravity:	1.1 – 1.2

Unit Definition

The activity of Zymase™ MA enzyme is expressed in GAU/g. One GAU produces 1 gram of reducing sugars per hour from 4% soluble starch, under assay conditions of pH 4.2, 60°C for 60 minutes. The assay method is available upon request.

pH Dependency

The pH range for the activity of Zymase™ MA enzyme is approximately from 3.0 to 5.0, with an optimum performance at pH 4.2. The exact pH optimum will depend on process variables, including temperature, time, substrate nature and concentration.

Temperature Dependency

The enzymatic activity of Zymase™ MA enzyme is effective in the temperature range from 40°C to 75°C, with an optimum performance at 60°C.

The exact temperature optimum will depend on many process variables, such as pH, time, substrate nature and concentration.

Inactivation

The enzyme can be inactivated by holding for 10 minutes at a temperature of 95°C.

Biochemical Parameters

Enzyme type:	1,4- α -D-glucan-glucosylhydrolase Amyloglucosidase
IUB #:	3.2.1.3
CAS #:	9032-08-0
Side activities:	Acid α -amylase, hydrolyses 1,6- α - glucosidic linkages; very low transglucosidase; traces of acid protease; (hemi) cellulase

Application Recommendations

The enzyme is used to produce glucose, starting from the non-reducing ends of starch chains and dextrins. In brewing the result of enzymatic action is in the increase of the wort fermentability.

Zymase™ MA is also able to very slowly hydrolyse α -1,6-glucosidic linkages.

The enzyme is optimally active at normal wort and beer pH values. Temperatures above 80°C rapidly inactivate the enzyme.

Zymase™ MA can be added to the brewing kettle or fermentor to create low carbohydrate ("Diet" or "Lite") super-attenuated beers. Zymase™ MA can be added to the mash mixer to improve fermentability or change the sugar spectrum of the resultant worts.

Another use for the enzyme is the replacing of priming sugar additions in bottled beers. Glucose is *in vitro* produced from oligosaccharides giving rise to an increase in perceived "dry sweetness character".

Dosage

A typical Zymase™ MA dosage rate of 7 to 25g/hL (depending on temperature, time, desired