

# FERMGEN™ 2.5X

Acid Fungal Protease Enzyme for Dry Grind Ethanol Production

## DESCRIPTION

FERMGEN™ 2.5X is an acid proteolytic enzyme characterized by its ability to hydrolyze proteins under low pH conditions. The broad substrate specificity of FERMGEN™ 2.5X protease enables the enzyme to efficiently hydrolyze most grain proteins in a random fashion.

## TYPICAL CHARACTERISTICS

**Activity:** 2500 SAPU/g (minimum)

**Appearance:** Brown liquid

**pH:** 4.0 - 5.0

**Specific gravity:** 1.12 - 1.20 g/ml

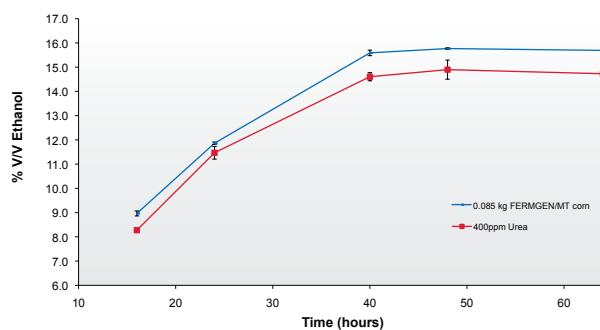
The activity of FERMGEN™ 2.5X protease is expressed in Spectrophotometric Acid Protease Units (SAPU). One SAPU is the amount of enzyme activity that liberates one micromole of tyrosine per minute from a casein substrate under conditions of the assay. A detailed assay method is available upon request.

## PERFORMANCE BENEFITS

FERMGEN™ 2.5X acid fungal protease provides the following benefits to ethanol producers:

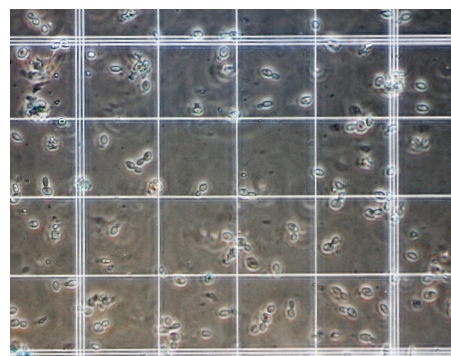
- Higher yields and faster fermentation rates for corn, milo and wheat mashes. This is the result of starch freed from protein matrices and enhanced yeast nutrition by specific amino acids as well as di- and tripeptides.
- Reduces or eliminates the need for emulsion breakers in back end corn oil recovery systems.
- Reduces the amount of Nitrogen (Urea or Anhydrous Ammonia) needed in fermentation.
- Enhances yeast propagation and yeast performance.

## EFFECT OF FERMGEN™ 2.5X ON RATE AND TITER

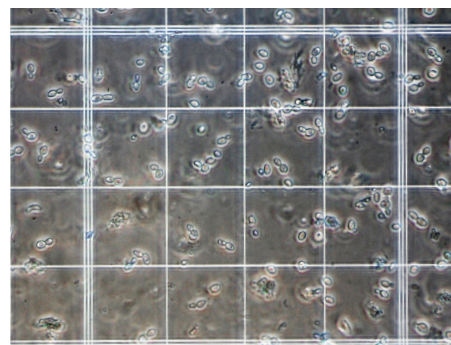


## EFFECT ON YEAST PROPAGATION

FERMGEN™ 2.5X significantly increases the rate of yeast propagation.



Control



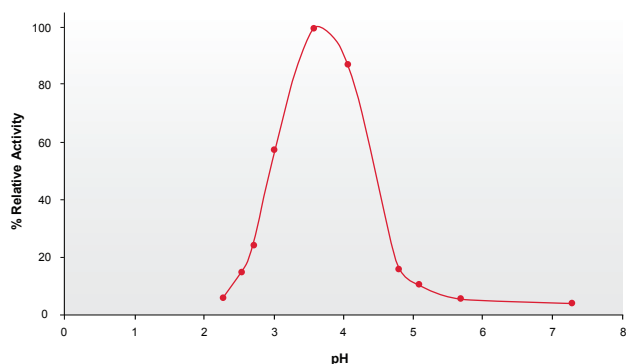
FERMGEN™ 2.5X  
Dosage: 0.12 SAPU/g DS

## RECOMMENDED CONDITIONS

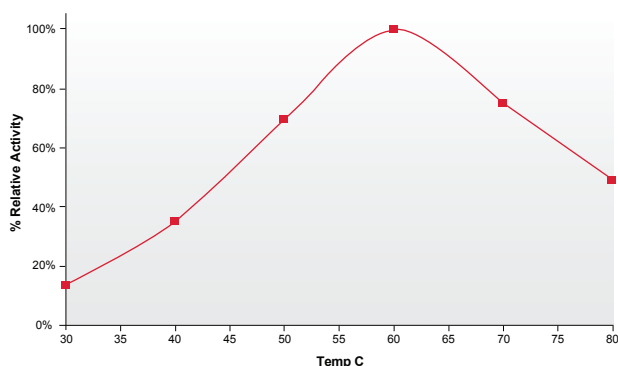
FERMGEN™ 2.5X protease functions effectively during typical simultaneous saccharification and fermentation (SSF) conditions: pH 3.0 to 5.0 and temperatures as low as 28°C. The product should be added in a single dose as early as possible to the propagation tank or the fermentor.

RECOMMENDED OPERATIONAL CONDITIONS	
pH	3.5 to 5.0
Dry Substance	26 - 38%
Temperature	The enzyme is effective up to 65°C, but works well at fermentation temperatures of 28 - 35°C

FERMGEN™ 2.5X activity pH profile



FERMGEN™ 2.5X temperature activity profile



## DOSAGE GUIDELINES

The optimal dosage level of FERMGEN™ 2.5X protease in simultaneous saccharification and fermentation is dependent upon processing parameters and the benefit being sought.

DOSE WT/WT AS IS GRAIN	BENEFITS
0.0006% - 0.0012%	Yield Enhancement
0.0017% - 0.0020%	Yield Enhancement Oil Emulsion Reduction
0.0030% - 0.0050%	Yield Enhancement Oil Emulsion Reduction Urea Replacement (75%)*

\*Reductions in urea of up to 75% have been observed in the field. An appropriate starting dosage can be established using your materials at the DuPont Applied Innovation Center.

## PACKAGING

FERMGEN™ 2.5X protease is available in various package sizes. Please consult your DuPont representative for detailed information.

## STORAGE

To ensure maximum retention of activity, store FERMGEN™ 2.5X protease under refrigerated conditions with the container closed.

## SAFETY & ENZYME HANDLING

Inhalation of enzyme dust and mists should be avoided. In case of contact with the skin or eyes, promptly rinse with water for at least 15 minutes.

For detailed handling information, please refer to the appropriate Material Safety Data Sheet, the Enzyme Technical Association (ETA) handbook *Working Safely With Enzymes*, and the Association of Manufacturers and Formulators of Enzyme Products (AMFEP) handbook *Guide to the Safe Handling of Microbial Enzyme Preparations*. All are available from DuPont.

## TECHNICAL SERVICE

Information covering specific applications of this product is available. DuPont will work with customers to enhance processes and solve problems.

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