

# Enzymes for BIOETHANOL & POTABLE ALCOHOL

Ver. 26.0



# Bioethanol & Potable Alcohol ENZYMES

| Product | Enzyme | Dosage |
|---|---|---|
| Grainzyme FL | Xylanase | 200-350 mL/ton related grain materials |
| Grainzyme NL | Cellulase | 20-100 mL/ton related grain materials |
| SQzyme HSAL | Alpha-amylase | 400-800 mL/ton related grain materials |
| LiqueStar | Alpha-amylase | 100-250 mL/ton related grain materials |
| LiqueStar EX | Alpha-amylase | 100-250 mL/ton related grain materials |
| SQzyme BAL | Alpha-amylase | 100-300 mL/ton related grain materials |
| SQzyme AGL | Glucoamylase | 500-800 mL/ton related grain materials |
| Fermentase L | Glucoamylase | 200-350 mL/ton related grain materials |
| Fermentase HX | Glucoamylase | 250-430 mL/ton related grain materials |
| Fermentase HX Pro | Glucoamylase | 230-400 mL/ton related grain materials |
| Fermentase THX | Glucoamylase & Trehalase | 250-430 mL/ton related grain materials |
| SQzyme FAL | Fungal amylase | 200-500 mL/ton related grain materials |
| SQzyme FYL | Phytase | 5-30 mL/ton related grain materials |
| Fermentase PSL | Acid protease | 10-25 mL/ton related grain materials |



# Function and Description

| Process | Product | Advantages and Benefits |
|---|---|---|
| **Mash Viscosity Reduction** | **Grainzyme FL**<br>**Grainzyme NL** | Highly effective enzyme solutions for reducing mash viscosity before liquefaction, specifically designed for wheat, triticale, and rye |
| **Liquefaction** | **SQzyme HSAL** | An excellent heat-stable alpha-amylase for liquefaction |
| | **SQzyme BAL** | A highly efficient bacterial amylase for liquefaction at medium temperature |
| | **LiqueStar** | A highly efficient alpha-amylase offering superior viscosity reduction with high concentration and low dosage |
| | **LiqueStar EX** | A superior alpha-amylase, boosts liquefaction & fermentation efficieny, enriches yeast nutrients |
| **Saccharification & Fermentation** | **SQzyme AGL** | A classic glucoamylase with great performance |
| | **Fermentase L** | A concentrated, high-performance glucoamylase with robust amylase activity |
| | **Fermentase HX** | A concentrated glucoamylase with enhanced amylase side activities, offering superior starch utilization and reduced residuals |
| | **Fermentase HX Pro** | An enhanced, well-balanced glucoamylase designed for optimal starch utilization and increased ethanol yield |
| | **Fermentase THX** | Concentrated glucoamylase with amylase and trehalase side activities, targeting to achieve ideal fermentation level |
| | **SQzyme FAL** | A classic fungal amylase for fermentation enhancement and lower residuals |
| | **Fermentase PSL** | A concentrated acid protease for higher yeast nutrition and corn oil yield |
| | **SQzyme FYL** | A highly effective phytase that enhances yeast nutrition and improves heat exchanger efficiency in long-term operations |

All listed enzymes are food-grade, Kosher & Halal certified, manufactured under the FSSC 22000 management system. Applicable to bio-fuel and potable alcohol production, all products comply with the recommended standards of JECFA and FCC.

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