

Laminarinase Technical Sheet

High activity enzyme to digest laminarin



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1. Product Overview

Our food-grade, high-activity Laminarinase is a powerful, clean-label enzyme designed to unlock maximum value from laminarin and other β -1,3-glucans, delivering rapid hydrolysis, improved extraction efficiency, and enhanced functional ingredient production. Manufactured to strict food-grade standards, it is non-GMO, allergen-free, and engineered for robust performance across a wide pH and temperature range, making it easy to integrate into existing food, beverage, nutraceutical, and fermentation workflows. By boosting yields of bioactive oligosaccharides, improving clarity and flavour in marine-derived products, and enhancing the digestibility and nutritional profile of plant and marine-based formulations, our laminarinase helps brands create higher-value, health-forward products with consistent batch-to-batch reliability. With strong technical support and dependable supply, it empowers processors to innovate, optimize, and elevate their product lines using sustainable marine biomass.

2. Product Characteristics

Parameter	Specification
Enzyme Class	EC number 3.2.1.39
Source	<i>Trichoderma reesei</i>
Activity	>2,500 LAM U per g
Appearance	Brown liquid
Temperature Range	15-55 °C
Optimal Temperature	45-55 °C
pH Range	3.5-8.6
Optimal pH	4.5-5.5
Shelf Life	12 months (sealed and kept under recommended storage conditions)

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3. Enzymatic Properties

3.1 Mechanism of Action:

Laminarinase is a hydrolytic enzyme that catalyses the degradation of laminarin, a β -glucan polysaccharide that serves as a storage carbohydrate in brown algae and some microorganisms. The enzyme acts primarily by cleaving the β -(1 $\rightarrow$ 3)-glycosidic linkages within the laminarin backbone, although some laminarinases can also hydrolyse β -(1 $\rightarrow$ 6)-linked branch points. Through this mechanism, laminarinase converts high-molecular-weight laminarin into smaller oligosaccharides and glucose, thereby increasing substrate solubility and accessibility. The catalytic process typically involves acid-base catalysis by conserved amino acid residues within the enzyme's active site, facilitating glycosidic bond cleavage and release of fermentable sugars. This activity is important in marine carbon cycling, biomass conversion, and industrial applications where the efficient breakdown of algal polysaccharides is required.

3.2 Inhibitors:

- Heavy metals (Hg^{2+} , Cu^{2+})
- Urea, Guanidine hydrochloride, SDS
- Extreme low or high pH
- High temperatures above 90 deg. C
- High chelator concentrations (EDTA)

4. Applications

1. Improvement of Animal Feed Digestibility:
 - Enhances the breakdown of laminarin-rich seaweed ingredients used in livestock, poultry, aquaculture, and pet foods.
 - Increases nutrient availability and feed conversion efficiency.
2. Production of Functional Food Ingredients:
 - Generates bioactive laminarin oligosaccharides with potential prebiotic, antioxidant, and immunomodulatory properties.
 - Used in the development of nutraceuticals and health-promoting food products.
3. Seaweed Processing and Valorisation:
 - Facilitates extraction and conversion of valuable compounds from brown seaweeds.
 - Improves recovery of sugars and other functional ingredients for food applications.
4. Prebiotic Ingredient Manufacturing:
 - Produces low-molecular-weight β -glucan oligosaccharides that can selectively stimulate beneficial gut microbiota.
 - Supports development of gut-health products.
5. Fermentation Substrate Preparation:

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- Converts laminarin into fermentable sugars for food-grade microbial fermentations.
 - Used in the production of organic acids, enzymes, probiotics, and other fermentation-derived ingredients.
6. Food Texture and Viscosity Modification:
- Reduces viscosity caused by β -glucan polysaccharides in seaweed-derived food ingredients.
 - Improves processing characteristics and product consistency.
7. Extraction of Bioactive Compounds:
- Enhances cell wall degradation in brown algae, improving extraction yields of polyphenols, pigments, minerals, and other valuable compounds.
8. Production of Seaweed-Based Beverages and Ingredients:
- Improves clarification, filtration, and processing efficiency during manufacture of seaweed drinks, extracts, and concentrates.
9. Sustainable Food Ingredient Development:
- Supports biorefinery approaches for converting marine biomass into food ingredients, helping reduce waste and improve resource utilization.
10. Aquaculture Feed Applications:
- Improves digestibility of seaweed-containing aquafeeds and may contribute to better growth performance and gut health in farmed fish and shrimp.

5. Handling & Storage

5.1 Storage Conditions:

- Store at 4–25 °C in sealed containers
- Avoid direct sunlight and freezing
- Keep away from acids, oxidizing agents, and heavy metals

5.2 Stability on Storage:

- Activity loss ~1–5% per month at room temperature
- Refrigeration improves stability

5.3 Safety Information:

- Non-toxic and biodegradable
- May cause allergic reactions via inhalation or skin contact
- Use protective clothing, gloves, goggles

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- Avoid aerosol formation

Refer to product SDS for complete safety details.

6. Packaging Options

- 0.1 kg, 1 kg, 10 kg, 25 kg

7. Quality Control Specifications

Test	Specification
Activity assay	≥ labelled activity
Microbial load	Total plate count ≤ 50,000 CFU / g
Pathogens	<i>Salmonella</i> negative, <i>E. coli</i> negative

9. Shelf Life

Liquid: 12 months. When stored in original container, sealed, in cool conditions.

10. Disclaimer

This technical data sheet provides general information. Application testing is recommended to determine optimal use conditions.

NOTE: THIS DOCUMENT CANCELS AND SUPERSEEDS ALL OTHER EDITIONS