

Potato Max Yield Pro Technical Sheet

High activity enzymes to digest starch for biofuels and cleaning



HIGH ACTIVITY ECONOMICAL



CLEANING



WASHING



BULK OPTION

 Scientific & Technical™

Potato Max Yield Pro Technical Datasheet

1. Product Overview

Potato Max Yield Pro is a specialized enzyme solution developed to efficiently digest potato starch for biofuel production and industrial cleaning applications. In biofuel processes, it helps break down starch-rich potato streams into fermentable sugars, allowing producers to improve conversion efficiency, increase yield potential, and recover more value from potato-based feedstocks or processing byproducts. In cleaning applications, Potato Max Yield Pro targets stubborn starch residues that build up on equipment, tanks, pipes, belts, and processing surfaces, helping reduce buildup, improve wash performance, and support faster, more effective cleaning cycles. Designed specifically for potato starch challenges, Potato Max Yield Pro helps turn difficult residues and waste streams into usable value, making it an effective choice for facilities looking to improve productivity, reduce waste, and get more performance from every potato-derived input.

2. Product Characteristics

Parameter	Specification
Enzyme Class	Various: 3.2.1.1, 3.1.3, 3.4.21.62, 3.2.1.4, 3.2.1.78
Source	Various: <i>Bacillus</i> , <i>Bacillus alcalophilus</i> , <i>Aspergillus spp.</i>
Activity	Various: Amylase 48,000 U per g, beta-Amylase 12,000 U per g, Protease 2,18 U per g, Lipase 25,000 U per g, Cellulase 3,000 U per g
Appearance	Light brown/brown liquid
Temperature Range	15–55 °C (operational)
Optimal Temperature	35–50 °C
pH Range	4.5–8.0
Optimal pH	5.0–7.0
Shelf Life	12 months (sealed and kept under recommended storage conditions)

3. Enzymatic Properties

3.1 Mechanism of Action:

A concentrated enzyme blend comprising amylase, cellulase, protease and lipase operates through distinct but complementary catalytic mechanisms that target major classes of organic macromolecules. Amylases (typically α -amylases) catalyse the endo-hydrolysis of α -1,4-glycosidic linkages in polysaccharides via a double-displacement mechanism involving a covalent glycosyl-enzyme intermediate, yielding oligosaccharides and maltose. Proteases, depending on class (e.g., serine or metalloproteases), facilitate peptide bond hydrolysis through nucleophilic attack on the carbonyl carbon of the amide linkage, forming a tetrahedral intermediate stabilized by an oxyanion hole before bond cleavage. Lipases catalyse the hydrolysis of ester bonds in triglycerides at lipid-

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water interfaces, often exhibiting interfacial activation; their mechanism involves a catalytic triad (Ser–His–Asp/Glu) and formation of an acyl–enzyme intermediate, followed by deacylation to release fatty acids and glycerol. The combined action results in the systematic depolymerization of heterogeneous soils into low-molecular-weight, water-soluble products.

From a kinetic perspective, each enzyme in the blend generally follows Michaelis–Menten behaviour under dilute substrate conditions, with catalytic efficiency defined by k_{cat}/K_m values that vary depending on substrate accessibility and environmental parameters. In practical cleaning systems, reaction rates are influenced by substrate heterogeneity, diffusion limitations, and surface adsorption phenomena, particularly for lipases acting at hydrophobic interfaces. Synergistic effects arise as initial hydrolysis by one enzyme increases substrate accessibility for others—for example, proteolytic disruption of protein matrices enhances amylase and lipase penetration. The formulation is typically engineered to maintain optimal activity within overlapping pH and temperature windows, while stabilizers mitigate denaturation and autolysis, preserving turnover rates over time. Additionally, competitive inhibition, product inhibition, and enzyme–enzyme interactions are minimized through careful ratio optimization, ensuring sustained catalytic performance in concentrated applications.

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. **Bioethanol production** from potato starch, potato waste, or starch-rich processing streams.
2. **Biogas production** by improving starch breakdown before anaerobic digestion.
3. **Potato processing wastewater treatment** to help reduce starch load and improve downstream handling.
4. **Conversion of potato peel waste** into fermentable sugars or more digestible material.
5. **Recovery of value from off-spec potatoes** that are unsuitable for food processing.
6. **Cleaning potato starch buildup** from tanks, pipes, pumps, and processing lines.
7. **CIP cleaning support** where starch residues are difficult to remove with standard cleaning systems.
8. **Cleaning conveyor belts and cutting equipment** used in potato processing facilities.
9. **Reducing sticky starch residues** in fry, chip, flake, and dehydrated potato production.
10. **Improving slurry handling** by reducing viscosity in starch-rich potato mixtures.
11. **Pre-treatment of potato mash** before fermentation or digestion.
12. **Reducing waste disposal costs** by converting starch-heavy byproducts into more manageable streams.
13. **Improving process efficiency** in facilities that handle high volumes of potato starch.
14. **Supporting circular economy initiatives** by turning potato waste into energy or reusable process value.
15. **Industrial cleaning formulations** designed to target food starch soils and residues.

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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
- 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